

# The Boston Medical and Surgical Journal

## TABLE OF CONTENTS

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### MASSACHUSETTS MEDICAL SOCIETY

PAPERS READ BEFORE THE COMBINED MEETING OF THE SECTIONS OF MEDICINE AND SURGERY, JUNE 7, 1916.

#### SYMPOSIUM ON GOITRE.

SURGERY OF THE THYROID GLAND. By C. A. Porter, M.D. Boston.....	551
RECENT ADVANCES IN OUR KNOWLEDGE OF THE ACTIVE CONSTITUENT IN THE THYROID: ITS CHEMICAL NATURE AND FUNCTION. By Edward C. Kendall, Ph.D., Rochester, Minn.....	557
CONDITIONS AFFECTING SECRETION OF THE THYROID GLAND. By W. E. Cannon, M.D., Boston.....	562
THE CLINICAL VALUE OF METABOLIC STUDIES OF THYROID CASES. By Walter M. Boothby, M.D., Boston.....	564
PARTIAL THYROIDECTOMY WITH LOCAL ANESTHESIA, SCOPOLAMINE AND MORPHINE. By Frank H. Lohr, M.D., Boston.....	566
THE TREATMENT OF GRAVES' DISEASE BY THE ROENTGEN RAY. By Malcolm Seymour, M.D., Boston.....	568

#### ORIGINAL ARTICLES

THE EXCRETION OF HEXAMETHYLENAMINE BY DAMAGED KIDNEYS. By George Gilbert Smith, M.D., Boston.....	569
THE ILEO-CECAL VALVE AND THE CHRONIC INTESTINAL INVALID. By John Bryant, M.D., Boston.....	572

### Massachusetts Medical Society.

PAPERS READ BEFORE THE COMBINED MEETING OF THE SECTIONS OF MEDICINE AND SURGERY. JUNE 7, 1916.

#### SYMPOSIUM ON GOITRE.

##### I.

#### SURGERY OF THE THYROID GLAND.

By C. A. PORTER, M.D., BOSTON.

THE surgical lesions of the thyroid which we have to consider are infections; simple bilateral diffuse hyperplasia, or hypertrophy of the gland; fetal adenomata; cysts; adenomata and irregular colloid tumors, often in combination; malignant tumors, sarcomata and carcinomata; and finally, toxic goitres and true exophthalmic goitre or Graves' disease. In infections, we have to do with drainage operations; at times, removal of portions of the gland; in the condition of adenomata, cysts, and colloid goitre, removal of the cyst, enucleation of the tumor or, as in the case of colloid growths, a sufficient removal to relieve obstruction to the trachea, esophagus, etc., or for cosmetic purposes; next, removal of tumors which, owing to their appearance late in life, or rapid growth, suggest the possibility of incipient malignant disease; finally attempt at cure or palliation, *i.e.*, tracheotomy, of actual malignant disease.

Of the goitres with toxic symptoms (so-called hyperthyroidism) there are two types: those in which a goitre has been present for varying lengths of time, followed ultimately by toxic symptoms, with or without exophthalmos; and, perhaps the *true type* of primary Graves' dis-

### BOOK REVIEWS

Pulmonary Tuberculosis. By Maurice Fishberg, M.D.....	574
Medical Hints for the Use of Medical Officers Temporarily Employed with Troops. By J. Edward Squire, M.D.....	574
The Basis of Symptoms, the Principles of Clinical Pathology. By Dr. Rudolph Krehl.....	574

### EDITORIALS

NEW ENGLAND SURGICAL SOCIETY.....	575
ELIMINATION OF THE RAT.....	576
COLORADO TUBERCULOSIS.....	576
THE REGULATION OF VENEREAL DISEASE IN AUSTRALIA.....	577
A NEW FORM OF POST-GRADUATE TEACHING.....	578
MEDICAL NOTES.....	578

### MASSACHUSETTS MEDICAL SOCIETY

STATE MEETING OF THE COUNCIL, OCTOBER 4, 1916.....	581
--	-----

### MISCELLANY

NOTICES, APPOINTMENTS, RECENT DEATHS, ETC.....	586
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case, in which general toxic symptoms not rarely precede or quickly follow the development of an enlarged thyroid.

1. In many infections there is undoubtedly a process in the thyroid gland which is shown by swelling, tenderness, increased size, fever, leucocytosis, pain (often referred to the back of the ear or neck), difficulty in breathing or swallowing. As a rule, under ice-bags such infections spontaneously subside without the formation of pus. Occasionally a definitely suppurative thyroiditis takes place with pus formation, requiring evacuation on ordinary surgical principles. I have seen a few cases which were diagnosed as ordinary deep cervical abscesses. In spite of the large venous supply of the gland, pyemia is rare, and the results of proper drainage excellent. Rarely, one sees, however, as a late result, acquired myxedema, which develops after destruction of the thyroid cells, which are replaced by scar tissue. Tuberculosis, actinomycosis and syphilis very rarely, but occasionally, affect this gland.

2. Simple bilateral diffuse hyperplasia, or hypertrophy, of the gland occurs very frequently in girls at or near the age of puberty, in many regions where goitre is endemic; not rarely after marriage, or during pregnancy. With very rare exceptions these hypertrophies should not be treated surgically, for they may disappear spontaneously, or through general medical treatment,—iodine, thyroid extract and x-rays. Inasmuch as they are practically without symptoms, and patients desire operations only for removal of the swelling in their neck, the surgeon must carefully consider whether the scar may not be more of a deformity than the original growth; and operations, if performed, must be done in such a manner that the lower

poles are left of symmetrical size in order that one side of the neck may not be smaller than the other.

3. Fetal adenomata occur as single or multiple, nodular, circumscribed tumors in one or both lobes, developing early in life, or at any period. They lead often to marked deformity, to pressure on the trachea or esophagus,—depending upon their location. If the thyroid enlargement takes place forward, between the sternomastoid muscles, pressure signs are often absent. If, however, a relatively small tumor grows behind the insertion of the sternomastoid muscle, pressure symptoms are apt to arise as the muscle holds back the tumor from any outward growth. With these fetal adenomata there occur varying degrees of toxic symptoms on the part of the heart, nervous system, etc., which are rarely, however, accompanied by exophthalmos.

Goetsch believes that these adenomata have the power of secreting an excess of thyroid juice, which explains the marked relief of general toxic symptoms which almost always follow their removal. Operation, though at times difficult, is most satisfactory, and consists either of enucleation of the nodules from the thyroid tissue, or occasionally it is simpler to do a lobectomy, provided enough thyroid may be left behind in the other lobe to carry on the function of the gland.

Cysts are not uncommon, varying in size from a marble to enormous tumors containing a couple of quarts. Into them, now and then, occur sudden hemorrhages, which may cause even alarming pressure symptoms, but apart from this, their harmful effect is purely mechanical. If a cyst is suspected no harm will come from aspiration with a hypodermic needle, for diagnostic purposes, followed, if deemed advisable, by the injection of carbolic acid, corrosive sublimate, or some irritant designed to prevent recurrence. It is important to make this diagnosis, for treatments by iodine, x-ray, thyroid extract, etc., are absolutely contraindicated and useless in cyst formation. If cysts are increasing in size, or causing obstruction, they should be removed with the technic which will be described in thyroid operations.

5. Colloid is the most common form of thyroid enlargement and varies in all degrees. As a rule, operation is desired for cosmetic purposes, or owing to the formation of large bilateral tumors in the neck, with a varying amount of pressure symptoms. It is surprising to see to what a huge size some of these tumors may develop without causing any symptoms whatever. In other cases thyroid enlargements take place posteriorly, encircling the trachea, or trachea and esophagus, and bring about severe obstructive symptoms. Iodine and thyroid extract, with or without x-ray, sometimes cause diminution of these tumors, but in general their effect is slight, and surgery fulfills here one of its safest indications. In such thyroid enlargements, occurring before puberty, operation

should be delayed as long as possible, lest too much of the more or less active gland be removed and interfere with the proper development of the individual.

In regard to the technic of operations for benign tumors of the thyroid, the first question for consideration is the choice of the anesthetic. As my experience increases, I am more and more in favor of local anesthesia, where the mental attitude of the patient is satisfactory. While a change from local to general anesthesia is always possible, it is time-consuming, increases danger of infection if the patient struggles; and much judgment should be used in endeavoring to select those patients who will satisfactorily put up with the idea of being conscious while their neck is operated upon, or occasionally bear a little pain or sense of dragging. I give sulphonal—grains 20 to 30—the afternoon previous to operation, and one or two doses of morphia, commencing an hour and a half before the appointed time. With the second dose, 1/120 of a grain of scopolamine, which may be repeated just before operation, if the patient is not sufficiently drowsy. This combination of sulphonal, morphia and scopolamine is most satisfactory when it works well, but occasionally there is excitement instead of quiet, a condition like coma vigil,—the patient sleeping until the surgeon starts to do something, then waking up and resisting. If a general anesthetic is to be administered in such instances, it must be given with great care, as the patient is often overdressed for a satisfactory ether operation. A pillow should be placed between the shoulders, so that the neck may be hyperextended, the table in moderate Fowler's position, facing a good light. No pains should be spared for a proper posing of the patient before operation, as great difficulty will be found in carrying out a proper technic if the neck slumps backward. There is no doubt that the collar incision of Kocher is the best for these operations. This may be placed across the bottom of the neck, where a necklace will later conceal the scar, or it may be made by a low incision over the sternum, when no scar will be visible unless a low-neck is worn. I use a 1 or 2% novocaine solution with 1:40,000 adrenalin chloride. It is best to mark out the line of incision by an intradermal injection of the solution, which should bring out a white wheal on the skin. The novocaine acts thus quite quickly from tension, more slowly from its anesthetic action. If you will recall your anatomy you will remember that all the nerves supplying the front and side of the lower neck emerge from the posterior border of the sternomastoid muscle, from its mid point downwards for an inch and a half; the superficial cervical branch, the inner, middle and outer branches of the supraclavicular nerves. While we are waiting for the novocaine in our line of incision to act, these nerves at this point should be anesthetized by deep massive infiltra-

tion. The skin and platysma muscle should next be incised, usually from external jugular to external jugular, the posterior incision extending somewhat upward, rather than transversely, in the lines of cleavage of the skin. The upper flap should be dissected to the level of the bottom of the thyroid cartilage, the lower down to the sternum. The enlarged anterior jugular veins next come into view, and must be carefully clamped and tied between ligatures. The sternomastoid muscles are then to be dissected free and retracted. If the tumor is a large one, there is no objection to dividing these muscles a half to two-thirds through; mattress sutures will ensure no deformity. The surgeon has next to consider the advisability of separation of the sterno-hyoid and thyroid muscles in the median line, with lateral retraction, or a transverse division of them at a higher level than the skin incision. There is little doubt that separation is preferable to division on account of less post-operative pain in swallowing, and freer movements when the wound is healed. Large or vascular tumors require free exposure for neat and bloodless work, and the muscles must then be divided. No time will be lost, and convenience assured, by immediate ligation of all skin vessels. Fine plain catgut should be used rather than silk, as in many instances chromic gut or silk ligatures are discharged from just under the skin some time after the wound has apparently healed. The intrinsic capsule of the thyroid varies much in thickness and in adherence to the gland. Any previous infection or treatment with boiling water, or x-ray, makes its removal more difficult. Anteriorly the capsule is of no importance, but if we are to operate upon both sides of the gland, it marks behind the curtain beyond which lie the recurrent nerves and the parathyroid bodies. When the muscles have been well retracted, careful inspection of both lobes is necessary to determine what operation shall be done,—enucleation of a cyst or an adenoma, removal of the anterior two-thirds or three-fourths of both lobes, or hemithyroidectomy on one side, and upper partial lobectomy on the other.

Lobectomy is comparatively simple and bloodless. The gland is grasped with gauze or a double hook, pulled toward the median line, and the upper and lower vessels clamped between forceps and divided. In spite of care there is often some troublesome bleeding near the middle of the gland, where the inferior thyroid breaks up into a number of branches. An injury to the nerve usually occurs from hurried grasping of a bleeding vessel through the capsule. Local anesthesia has the great advantage that it forces the surgeon to work gently and slowly, and any change of voice can be immediately noted. As a rule, these manipulations are painless, but occasionally the patient complains when a ligature is tied, or the tumor is dragged upon. Several times I have enucleated a cyst or tumor from

behind the sternum, and have been surprised at the freedom from pain. If supplementary injections of novocaine are necessary, it must be remembered that several minutes are required for complete anesthesia. The common error made is to begin without this delay. In large, irregular tumors, Balfour's suggestion is valuable, *i.e.*, the division of the isthmus, and separation from the trachea of the two halves of the glands from within outward. After the amount to be removed has been determined, every effort should be made to control the blood supply by deep mattress sutures or pressure by the finger on the vessels at the base of the lobe. When all bleeding has been stopped, the remains of the lobe are then sutured, leaving behind the lower rather than the upper poles. In all cases of tracheal obstruction, local anesthesia is invaluable. When once the trachea has been bared and is clearly visible to the eye, a general anesthetic may be safely administered, if necessary. In spite of all precautions, hemorrhage (sometimes serious) takes place in a definite proportion of cases. Most frequently a vein is torn in delivering the gland,—a danger much increased when patients are cyanotic from obstruction or vomiting under ether. In general, drainage can be omitted. If used, a small stab wound through the lower flap is preferable to its insertion through the line of incision. Whenever there is mild infection of a drain through the incision, there is apt to occur a dimple adherent to the deeper tissues, which causes an unsightly deformity, and dragging on deglutition. The platysma must always be sutured with care; the skin incision closed either by a sub-cuticular catgut suture, or interrupted fine silk or horsehair stitch loosely tied and removed within three days. With this technic the scar of the collar incision is practically invisible. A moist dressing for twenty-four hours allows oozing from the drain or between the stitches. At the end of two days the drain should be removed, and in the mean time great care must be taken to prevent infection from looseness of the dressings. I use a single large gauze sponge, snugly held to the skin by adhesive plaster at the top. This is raised like a lid, and the dressing applied, which is held in place by a towel passed behind the neck, crossed and pinned to a swathe in front. For several days flexion of the head is painful, and patients are bothered a good deal by mucus and difficulty in swallowing. If no drainage is used, in spite of careful hemostasis, there occasionally occur collections of bloody serum which have to be evacuated, and not infrequently one notices little collections just under the skin of a sterile bloody serum, which has to be pricked like a blister. The above-outlined technic is applicable to all benign tumors and cysts of the gland which require removal. I have had several rather alarming hemorrhages during the operation, but as yet no case of sec-

ondary hemorrhage. Three times a recurrent laryngeal nerve has been injured, either in the dissection, or carelessly grasped in the attempt rapidly to control bleeding. Though some of the tumors and cysts have been very large—one filling up a third of the superior mediastinum, and another adherent to the sternum beyond its middle—I have had no death in more than 100 cases until last month, when an old lady of 65, who for 40 years had had a very large cystic tumor, died from hemorrhagic nephritis and bronchopneumonia.

There have been a few instances of continued growth of the tumor or formation of a new cyst, making necessary a second, and twice a third operation. The surgery of non-toxic goitre, then, though often difficult, is extremely satisfactory—the cosmetic results good. The exact opposite is true of malignant disease. In the last fifteen years there have been twenty operations at the Massachusetts General Hospital. Of these, 17 were cancer and 3 sarcoma. One case was 25 years old, one 29, one 32, one 33 all the others over 40. The oldest patient (63 years of age) had had an enlarged thyroid for twenty years, with rapid growth in the last two. There were five cases of very long duration of a goitre subsequently undergoing malignant degeneration,—one 35, one 25, one 20, one 12, one 7, another 4 years after onset. This shows quite clearly what my experience confirms,—that the development of an enlarged thyroid after fifty, or rapid increase in a long-standing goitre, is an indication for immediate operation. When once the diagnosis of cancer is clear, from the stony hardness of the tumor, paralysis of the recurrent laryngeal nerve, and enlargement of the adjacent lymphatics, a radical operation is practically hopeless. The only chance of cure rests in a thorough operation before the carcinoma has spread beyond the capsule of the gland. In one private case such an operation was done, with the removal of a portion of the esophagus. For a year there was complete comfort, but recurrence then took place. In two other patients over sixty, with rapid growth in a few months, recurrence followed operation too soon to make it worth while. Where obstruction to respiration makes tracheotomy necessary, local anesthesia is clearly indicated. This will be found to be a most bloody and trying operation, not rarely followed by secondary hemorrhages; pneumonia and bleeding commonly end the life of these wretched patients.

We have next to consider the toxic cases—so-called hyperthyroidism. As my paper deals only with the surgical aspects of Graves' disease, I shall not enter into the various theories as to its causation and complex relations or interrelations with the other glands. One thing remains clear—the etiology is not yet thoroughly understood. It is also, I think, impracticable to divide the toxic cases too minutely into groups. Broadly speaking, however, there are two

types: one, where the patient for months or years has had an enlarged thyroid, and subsequently developed the toxic symptoms; another group where, preceding any manifest thyroid enlargement, there is nervousness, tachycardia, palpitation, etc., or the general symptoms develop with an increasing enlargement of the gland. If any rough distinction can be made, the first class may be called tumors with hyperthyroidism; the second, true cases of exophthalmic goitre. It is in this latter class (2)—though, of course, there are exceptions—that we find the most severe toxemia, exophthalmos, and the greatest loss of weight. What, at present, are the indications for surgery in these two types of cases? What are the dangers of operation, and what has surgery to offer better than medical treatment? Quite recently the x-ray, being safe and favorably regarded, is being used more and more. The invention of the Coolidge tube, which allows measured, massive dosage, may prove a valuable aid in this disease. Personally, I have been in the habit of having one or two thorough treatments previous to operation. I have had little experience with long-continued treatment. While, undoubtedly, marked improvement has occurred, particularly in the milder cases, I have not been impressed with the results, and in one case in particular, I can see very little improvement after a year of treatment. Dr. Seymour, who has recently been following a series of cases, will later give us his impressions. It has one great advantage,—if not persisted in too long,—the element of safety and the absence of scar. There are some surgeons, notably Kocher of Berne, who think that surgery is the ideal treatment for thyrotoxicosis. He operates as early as possible after a very brief period of rest, and refuses operation on all advanced cases. His mortality is small (about 4%), because, in fact, he operates upon a selected group of cases. The general feeling at present is, I think, that all cases of Graves' disease should first be treated by rest and medical treatment. If satisfactory improvement occurs, this may be continued, but is not applicable to wage-earners and those who cannot give up the time. While under neutral bromide of quinine and other drugs, almost miraculous improvement takes place now and then, it is my experience that such cases are apt to recur, and that if lobectomy, single or double partial, has been performed, cures occur more rapidly and are more permanent. I would advise operation of some sort, then, in cases where improvement is unsatisfactory under medical means; in cases which have already lasted more than a year, with commencing myocardial weakness, exophthalmos, etc., or where it is unlikely that medical treatment will act sufficiently quickly to bring about a satisfactory result. Plummer of Rochester believes that after a year, operation is less hazardous than in the early stages. My experience has shown that



Graves' disease in girls from 18-20, particularly if the mental attitude is excitable, has seemed to carry a grave operative prognosis. Another type in which the risk is poor are women between 40 and 50, who are apparently passing through the menopause. The Hebrew race, owing to their neurotic constitution and lack of control, make a calm preparation for operation difficult, and I have had, among them, a comparatively large mortality. There is another group of rather chronic cases of years' duration, with ups and downs,—exophthalmos, rather firm vascular glands, tachycardia, often irregularity of the heart,—in which there is doubt as to whether the patient is actually suffering from Graves' disease or the aftermath of a passed toxemia. It is in this type that the various newer tests are of very great value. I mean estimation of the carbohydrate tolerance, basal metabolism, differential blood counts, injections of adrenalin, etc., in order that we may determine, if possible, whether the symptoms are due to an overactive gland. In these cases it is probable that other glands, the sympathetic system, and the myocardium have been affected; and it is often a nice question of judgment to decide for or against operation.

Before considering operation, there is one thing I wish to emphasize, and that is an increasing conviction that the psychic influences before operation are of extreme importance—in fact, I believe make for recovery or death in certain instances. The surgeon should have absolute control of the situation, and the complete confidence of the patient who, if possible, should look forward to the day of operation, unless we follow Crile in all detail in his "theft of the thyroid." In no other surgical disease do the surroundings, methodical nursing, cheerful mental attitude, etc., count so much; to no other patients do the occasional worries and effects of a large clinic work so great a detriment. If, as I believe, the mental attitude of the patient is so important, it is queer that surgeons have not come to more unanimity upon the choice of an anesthetic. Kocher has always insisted upon local anesthesia, and I have seen him adhere to this rule to, if not beyond, the limit. The Mayos, whose mortality is equally small, have the patient brought to the amphitheater and quietly etherized by the drop method. Crile, as we know, endeavors to carry out his anoci conception, planning to keep the actual date of the operation from the patient, and gives gas and oxygen in the patient's bed. As my experience increases, I am more and more in favor of the morphia-scopolamine sequence with local anesthesia, when the patient's mental attitude is favorable and the drugs act well. In a few operations I have had to abandon local anesthesia, owing to the complete lack of control of the patient, and have felt that this abortive attempt was much worse than if I had started with a general anesthetic. Indeed, I will go further

and say that in bad cases of Graves' disease, if anything goes wrong with the preparation for operation, and a patient arrives in a highly excited condition, it is always best to delay for a more favorable opportunity.

From the 185 cases in hospital and private practice which I have had, I have selected the 85 which, at time of operation, showed definite Graves' disease or hyperthyroidism present, or very definite in the immediate past. I have excluded the milder cases of transient hyperthyroidism, and considered them in the previous part of this paper. In these 85 cases I have performed 31 ligations, 19 hemithyroidectomies; in 17 the right lobe was removed with ligation of the vessels on the left; in 18 the major portions of both lobes, leaving a bit of the upper or lower poles, and a posterior strip of the gland. Double partial lobectomy is, in my opinion, a more severe and bloody operation than hemithyroidectomy; but as I look over my cases I feel that more immediate improvement takes place, and the danger of recurrence of symptoms is less. The most difficult question to determine when once operation has been decided upon, is between preliminary ligation of vessels, or removal of portions of the gland. Upon this question different surgeons are not in agreement. A majority, I believe, feel that in the severer cases a preliminary operation of ligation, usually under local anesthesia, makes a subsequent thyroidectomy less dangerous. Whoever has done a secondary operation on these cases is convinced of two things,—that ligation makes the operation somewhat harder, owing to adhesions, and secondly that the ligation of the superior vessels has not much diminished the vascularity of the gland. I think the benefit which frequently follows is due to division of the sympathetic nerves accompanying the vessels. In two cases only has ligation of the superior vessels been sufficient to bring about a cure; after it there has usually been either no perceptible improvement or a period of improvement followed by recurrence. It should be regarded distinctly as a preliminary operation and should, at varying periods, be followed by further operation. In a number of my cases, before the patients would consent, intervals of from one to three years have elapsed, at which time the element of safety after ligation is probably abolished. In such cases, therefore, we should consider, if they are severe, further ligation of vessels before thyroidectomy. In other words, after ligation of the superior vessels, there seems to be, according to my experience, after ten days or two weeks, a diminished danger in operation. After a long lapse between ligation and operation, the risk seems to be that of a primary thyroidectomy. I have analyzed, very carefully, my fatal cases, some of which date back to 1909, in order to learn, if possible, any avoidable mistakes. I have had five deaths from toxemia,—one in a suicidal, extremely toxic case, with pho-

tophobia and confinement in a dark room for three months. Ligation was simple, but in spite of all treatment, death with all the characteristic symptoms, occurred at the end of three days. This was a desperate risk taken deliberately. Of the four other cases the operation was a primary lobectomy; two were in young girls eighteen and twenty-five years; two middle-aged women undergoing the menopause.

The one aged eighteen deceived me in her degree of toxicity. Right hemithyroidectomy with ligation of the left vessels was performed under ether, in 1910, and was followed by a typical toxic death in three days. The one aged twenty-five was a very toxic case; had been sick for eight years, and did not improve under three weeks in bed with rest treatment; in fact, on the whole, seemed worse. Right hemithyroidectomy, under gas and oxygen with ligation of the vessels on the left was performed; operation comparatively easy; died on the third day of typical toxemia.

A girl of thirty had extreme symptoms for two years; was unable to work for a year; fell exhausted on the street several times; treated in medical ward without improvement; heart irregular; marked systolic murmur with some enlargement. Right hemithyroidectomy under gas and oxygen, and partial left thyroidectomy were performed with extreme reaction, which persisted unusually long, leaving marked condition of prostration; patient died nine days after operation. All of these three were early cases, and at present I believe that a preliminary ligation should have been done, or the patients should have had x-ray treatment previous to operation.

A Jewish woman of forty, undergoing the menopause, suicidal for a year, refusing operation four successive mornings. Finally she consented to it if I would perform it in the afternoon. Rather against my judgment, at the earnest solicitation of her husband, I agreed to do it, under gas and oxygen, removing the right lobe and half of the left. There was considerable bleeding, and with excessively rapid pulse the patient died in three hours. This was in 1909, and did much to influence me against operation. I have broken this rule since then once or twice, always to my regret, and with a severe operative, though not fatal, toxemia; until in March of this year I had another death, the first since 1912. A Jewess of 47 had been ill for five years with nervousness, headache, irregular menstruation, edema and dyspnea, pain in the upper abdomen, rapid pulse, with some enlargement of the heart, some glycosuria, unable to work. Under careful medical treatment for two and a half weeks, she lost seven pounds, and tachycardia and nervousness persisted. I advised ligation under local anesthesia as a preliminary. She had her morphia in two doses and was apparently drowsy, but before operation could be begun she jumped up from the table and insisted upon going home. Three days

later she consented, provided her daughter was present, to have operation under gas and oxygen. I performed a double partial lobectomy without difficulty, but from the time of her recovery from the anesthesia, extremely rapid pulse with excessive nervousness began, and increased until death, at the end of forty-eight hours. This illustrates strikingly, I think, a bad risk in a woman who was steadily running downhill. Operation undertaken was the only hope, and owing to lack of control, toxemia started before operation, and was only increased by it—I think it an error of judgment in attempting to benefit a patient unwilling to accept one's best advice. In four cases severe bronchitis, pneumonia or bronchopneumonia, for reasons which I cannot explain, ended fatally in from a week to a month. In the latter long case the ultimate cause of death was heat prostration in the severe July of 1911. A fifth case died, so far as could be made out, from a terminal pneumonia, aided probably by unsuspected morphinism. Why pulmonary complications should have occurred in these cases and been absent in the non-toxic goitres, it is impossible for me to explain. Another death, similar to a case of Dr. Judd's in Rochester, I cannot understand. Autopsy showed purulent pericarditis, enlarged thymus and adrenals, as a cause of death thirty-six hours after a simple ligation with a clean wound. In another, a large infarct of the right lung, after a very satisfactory gas and oxygen thyroidectomy, caused death on the third day. In this series of 185 cases, there was one instance of tetany—the first post-operative case at the Massachusetts General Hospital. A young girl of eighteen, with severe Graves' disease, had double ligation under ether in 1911, followed by marked improvement which lasted for almost two years—then recurrence of symptoms. Under gas and oxygen in October, 1914, right hemithyroidectomy and partial left lobectomy were performed. The operation was apparently intracapsular. On the fourth day characteristic tetany developed, which was controlled with calcium lactate. In spite of parathyroid tablets and continued calcium lactate, severe convulsions occurred, followed in January, 1915, by acute mania and death. It seems to me necessary to believe that in this instance the blood supply of the upper parathyroids was cut off by the ligation, or the unfortunate patient had an abnormally small number, for the operation was performed in such a manner that some of the parathyroids under normal circumstances must have been conserved. Thus this analysis seems to show that the danger of toxemia is diminished by preliminary ligation a short time previous to thyroidectomy; that perfect control of these patients is necessary, lacking which operation should not be performed. There has been no death from pulmonary complications following local anesthesia. The case of pul-

monary infarct and purulent pericarditis seems to me to be impossible to avoid.

In endeavoring to analyze the good results of operation, it is most difficult to make satisfactory statistics. Those who have seen the very marked relief within a few days which follows lobectomy, are absolutely convinced that the thyroid *has to do* with Graves' disease. On the other hand, there are occasional cases which, in spite of ligature and lobectomy, disappoint us with their lack of improvement. Some surgeons believe that the thymus gland is in part responsible for the symptoms, and state that improvement has finally taken place after thymectomy. With this operation I have had no personal experience. I am inclined to believe, however, that the failure distinctly to improve or cure a majority of these cases is due to delay in operating until permanent degenerations have taken place, or some not understood action of the sympathetic nerves or other glands in the body.

I have operated upon some quite desperate cases with marked improvement. One, a young girl, with congenital heart murmurs who, it was decided, could not survive the cardiac lesion plus the toxemia of Graves' disease, has been practically cured, as far as any toxemia is concerned, by preliminary ligation, followed later by thyroidectomy. Another woman who was bedridden with coincident mitral insufficiency and severe Graves' disease, is now entirely cured of all her Graves' symptoms, except slight exophthalmos. Another middle-aged woman, bedridden, with marked edema and rapid, irregular pulse, has, after operation, improved so that she can do her work, though some tachycardia and irregularity of the heart persist. Another woman of fifty-five, confined in an asylum, much to my surprise became almost normal after operation; was able to look after herself and go to the theatre alone; dying suddenly of pneumonia a year afterwards. In my experience, the cases which have had exophthalmos for any length of time never again have normal eyes, and not a few of the cases apparently cured under normal circumstances show, under excessive fatigue or worry, slight tachycardia and tremor. Of the 85 cases, 20 are absolutely cured, 18 much improved, 13 improved, 4 not improved and require further operation; 16 have not reported, or done so in too general terms to be valuable for statistics. If then, after a patient has had a reasonable course of rest, medical treatment and x-ray treatment (if this proves to be really and permanently satisfactory), the symptoms persist, operation should be advised. Among wage-earners, who cannot give up the time, and in the chronic cases, in which the disease has advanced too far to allow of delay, after preliminary rest, operation should be performed. Whether this be a preliminary ligation, or lobectomy under local or general anesthesia, must be determined in each

case. Finally, in chronic cases in which there is doubt as to whether the patient is suffering from existing toxemia or has been poisoned irreparably by the disease, modern tests, of which basal metabolism is probably the most important, will aid the surgeon much in deciding for or against operation.

## II.

### RECENT ADVANCES IN OUR KNOWLEDGE OF THE ACTIVE CONSTITUENT IN THE THYROID; ITS CHEMICAL NATURE AND FUNCTION.

By EDWARD C. KENDALL, Ph.D.,

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ABOUT eighteen months ago I reported the isolation from the thyroid of a crystalline compound containing 60% of iodine. Since that time I have perfected the method for its isolation, and to some extent have studied its chemical properties and functions. The work may be briefly summarized as follows:

The compound was first isolated in crystalline form in 1914. The work just prior to the isolation had been accomplished with such smoothness and success that no difficulty was anticipated in repeating it, but despite most persistent efforts, no more crystals were isolated until August, 1915. Again it seemed that the isolation had been perfected, but try as we would, no more crystals were seen until February, 1916. This failure occurred in spite of the fact that

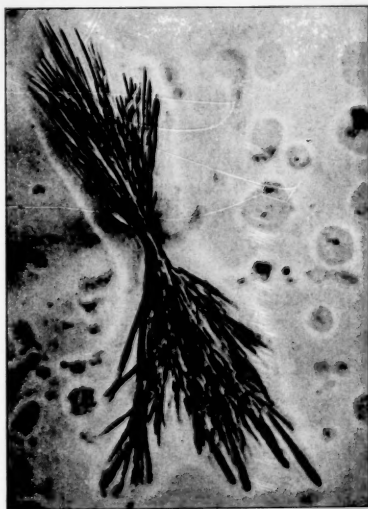


FIG. 1.—Crystals of the alpha iodine compound, which is the active constituent of the thyroid.



FIG. 2.—Appearance of patient upon entering clinic.



FIG. 3.—After six months' treatment with the alpha iodine compound. Patient had grown  $3\frac{1}{2}$  inches.



FIG. 4.—Appearance of patient upon entering clinic.



FIG. 5.—After six months' treatment with the alpha iodine compound. Patient had grown  $3\frac{1}{2}$  inches.



FIG. 6.—Appearance of patient upon entering clinic.



FIG. 7.—After 18 days' treatment, during which time patient received a total of less than  $\frac{1}{3}$  of a grain of alpha iodine compound.



FIG. 8.—Appearance of patient upon entering clinic.

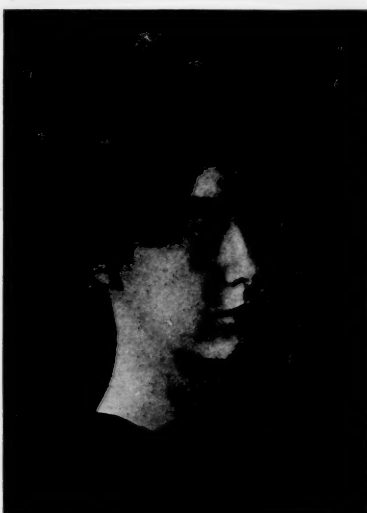


FIG. 9.—After 18 days' treatment, during which time patient received a total of less than  $\frac{1}{3}$  of a grain of alpha iodine compound.





FIG. 10.—Appearance of patient upon entering clinic.



FIG. 11.—After 24 days' treatment, during which time the patient received the alpha iodine compound.



FIG. 12.—Appearance of patient upon entering clinic.

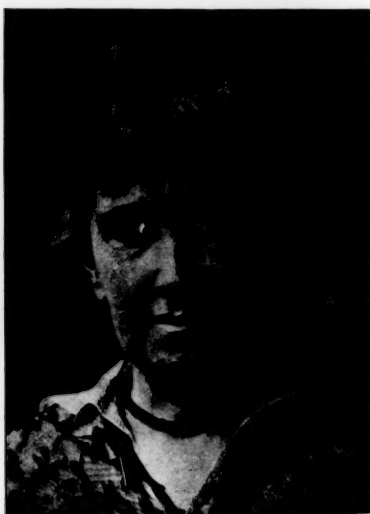


FIG. 13.—After 24 days' treatment, during which time the patient received the alpha iodine compound.



FIG. 14.—Normal monkey before injection. Weight 13½ pounds.



FIG. 15.—Same monkey after 72 daily injections of 1½ milligrams of alpha iodine compound. Weight 6 pounds.

the work was vigorously carried on, more than a ton of thyroid being used. It was found by accident that carbon dioxide plays a most important rôle. When I first obtained the substance I was working in a room next to a freezing microtome, and the necessary carbon dioxide was supplied from this source. Later the work was carried on in a room free from excessive carbon dioxide, and crystals were not obtained until it was accidentally discovered that carbon dioxide is necessary.

The reason for the delay and difficulties in this problem lies in the fact that the substance does not exist in a free form in the thyroid secretion, but is firmly locked into the protein molecule. This bond is so secure that it will withstand very vigorous chemical treatment. It is very resistant and the compound is not easily destroyed, but under other conditions simply dissolving will result in the destruction of the compound. The explanation of this behavior lies in the fact that carbon dioxide exerts a peculiar and unique action on the bond that ties the iodine compound within the protein molecule. In short, this bond, which will resist heating with

50% sodium hydroxide, is broken by carbon dioxide and the iodine compound is set free. Having once been liberated from the rest of the protein constituents, its chemical properties permit of very easy separation.

Having separated the crystalline compound containing 60% of iodine from the thyroid, several questions arise as to the relation of this compound and thyroid activity. Thyroid activity can be followed experimentally and clinically, in five broad aspects, namely, the effect on growth, on the mentality, the skin, the hemoglobin, and, greatest of all, the effect on metabolism, and, incident to this, the effect on the heart. It seems indisputable that all of the effects produced by the thyroid are through its effect on metabolism. The combustion of proteins, fats and carbohydrates is increased by the administration of thyroid substance, and it is probable that the various clinical changes produced are due to increase in cell activity through the entire body. The mentality is increased because of the increased blood flow, and the increased metabolism going on in the

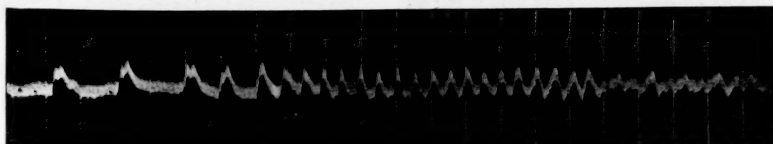


FIG. 16.—Ventricular fibrillation of a goat's heart produced by 11 successive daily injections of the alpha iodine compound. Pulse rate 600.

brain cells; the condition of the skin is improved because metabolism within the skin cells is increased; and so it is through the entire body. We have experimented with this substance on animals and have obtained a large number of results from clinical observations. It appears that the entire activity of the gland is manifested by the administration of this crystalline compound alone. There appears to be no other substance in the thyroid secretion which acts directly. This substance, given even in very small amounts, will supplant thyroid activity, relieving the conditions of myxedema and cretinism, and in excess will produce symptoms simulating exophthalmic goitre. It appears to have no direct action on the pulse rate. The extent to which the rate is affected depends not upon the administration of the thyroid, but upon the simultaneous ingestion of food, and in particular of amino acids. This effect may be outlined as follows:

After the administration of the compound, there is no apparent effect for many hours. There is no increased pulse rate, nor drop in blood pressure. However, if the thyroid hormone and amino acids are injected simultaneously, the pulse rate is enormously affected, and even death may result, due to the apparently great increase in metabolism going on in the animal. It appears very probable that the thyroid hormone manifests its activity by reacting in some way with amino acids. The accompanying are typical pictures, which illustrate the effect on myxedema and cretinism, on the mentality, on the skin, and the great emaciation with a toxic effect on the heart after long-continued injection.

### III.

#### CONDITIONS AFFECTING SECRETION OF THE THYROID GLAND.

By W. B. CANNON, M.D., BOSTON.

[From the Laboratory of Physiology, Harvard University.]

A STUDY of the conditions of activity in the ductless glands, which pass their secretions into the blood stream, is difficult because recognition of the secretion in the blood is uncertain or impossible. It has long been known that physiological activity is accompanied by the development of an electrical difference, which may be manifested by connecting an active part with an inactive part through a delicate galvanometer. It seemed possible that by the application of this method important information might be obtained as to the conditions of activity of the ductless glands. This work has been carried on through the coöperation of Mr. McKeen Cattell.

The method was first justified by applying it to the submaxillary gland, which has an external secretion. Because an electrical change ac-

companies the secretion of saliva, even though the blood supply is shut off from the gland or the flow through the duct is stopped; and because the change is absent when secretion is absent, although each of the conditions attendant on secretion—such as contraction of blood vessels, relaxation of blood vessels, faster flow of blood, slower flow of blood—may severally be induced, the conclusion is drawn that the electrical change is a manifestation solely of the process of secretion.

The method thus justified on the submaxillary gland has been applied to the thyroid. Histologists have described nerve fibres leading to the cells of this gland, and anatomists have reported that the fibres going to the thyroid gland arise in the cervical sympathetic ganglia. Previous investigators have shown that severance of its cervical sympathetic nerves causes atrophy of the thyroid, and stimulation of these nerves causes a diminished iodine content of the gland. Severance of the vagus nerve supply has no effect.

If the thyroid gland and neighboring indifferent tissues are connected through a galvanometer, stimulation of the sympathetic strand high in the thorax evokes an action current after a latent period, varying usually between 5 and 7 seconds. This effect persists after the superior and the recurrent laryngeal nerves are severed. Experiments have shown that the nerve impulses pass out through both the superior and inferior cervical ganglia.

Stimulation of the main trunk of the vagus nerve in a curarized animal, or injection of pilocarpine (which excites vagus endings), has no effect in producing an action current in the thyroid gland.

The influence of sympathetic impulses is not indirect, through local anemia of the gland, for when the blood supply is wholly stopped by clamping the blood vessels for a period equal to that of sympathetic stimulation, no noteworthy electrical change is produced.

The conclusion is drawn, therefore, that the nerves distributed to the thyroid cells belong to the sympathetic and not to the vagus supply, and that their effects are not indirect through alterations of blood flow; indeed, that they are true secretory nerves.

It is known that the internal secretion of the adrenal gland, or adrenin, will have the same effect in the body as sympathetic nerve impulses. Injection of a small dose of adrenin, 0.1 to 0.2 cc. (1:100,000), evokes a marked action current in the thyroid gland. Also, stimulation of the nerves to the adrenal glands, so as to cause their secretion to be poured into the blood stream, will evoke a characteristic electrical change in the thyroid. This electrical change does not occur if the return of blood from the abdomen is prevented, but takes place promptly when the pent blood is released. Furthermore, it fails to appear after stimulating these nerves, if the adrenal glands have been previously re-

moved. There is thus definitely established an influence of adrenal secretion on thyroid activity.

This conclusion has been confirmed by the observations of Dr. Robert L. Levy, working in the Harvard Laboratory. He has found that both stimulation of the cervical sympathetic trunk and injection of stimulating doses of adrenin greatly augment the effects of small doses of adrenin in raising blood pressure. This increase of efficacy of adrenin is not produced if the thyroid glands have previously been removed.

Studies on conditions of activity of the adrenal glands have shown that during emotional excitement they secrete into the blood a substance which affects the bodily organs in a manner simulating the nervous influences of strong emotions. These glands have a routine function, without which certain bodily processes are not normal. They may also be reasonably regarded as having a normal *emergency* function, which is exercised in times of emotional stress, and is important under such circumstances for the needs of the organism, for example, in struggle. This conception of an emergency function gives meaning to the liberation of sugar in the blood, abolition of muscular fatigue, dilatation of bronchioles, inhibition of digestion, redistribution of blood in the body, and rapid coagulation—all changes attending great excitement.

If we conceive the organs disturbed in emotional stress as being protected from such disturbance by a high neurone threshold, requiring great excitation in the central nervous system before the threshold may be crossed, we can account for persistent disturbance of these organs in pathological cases on the basis of a wearing down of the threshold through great or repeated emotional disturbances. Thus there might be gaps here and there in the wall that protects the organs from being over-excited. Under such circumstances, even slight central disturbances might result in persistent stimulation of organs normally brought into action only when such action would be useful, *i.e.*, in times of emotional excitement, when struggle might be essential. If a certain region, *e.g.*, the cervical sympathetic, is thus persistently stimulated by experimental means, most of the phenomena of exophthalmic goitre may be produced. This concept offers an explanation for emotional tachycardia, emotional dyspepsia and perhaps other conditions which present a history of previous great worry or emotional stress.

To test the effect of over-stimulation in a particular region of the sympathetic system, Dr. C. A. L. Binger and I, about two years ago, fused in the cat the anterior root of the right phrenic nerve with the right cervical sympathetic strand. Thus, after regeneration had occurred, there was delivered to the neurones in the superior cervical ganglion a volley of im-

pulses every time the animal breathed. The operations were performed early in May. In October, 4 of the 6 animals were still alive. All had peculiar symptoms. There was marked tachycardia,—the average heart rate in normal cats is about 150 per minute, in 30 observations on these animals it was 222. Though fed like normal animals, they had loose movements of the bowels. They were unusually excitable, as indicated by rushing away when taken in hand or petted. The basal metabolism, as determined by Dr. Reginald Fitz, working in the Carnegie Nutrition Laboratory, was found in normal cats to be approximately 31 calories per square meter of body surface per hour. In 3 of the 4 animals in which the operation had been performed, the metabolism was much elevated. In one of them (in all ways the most profoundly altered animal) it rose to an average of 72 calories per square meter per hour,—an increase over 130% above the normal average. In others the rise was approximately 100%. In two animals that died of the disease, the adrenal glands were found much increased in weight. In one of them the glands were three times the average weight, the increase being chiefly in cortical substance. One of the animals had definite exophthalmos and respiratory oscillations of the pupil on the operated side. These symptoms are, in the main, characteristic of exophthalmic goitre as seen in man.

Since these first observations, the disease has been produced in another animal, and it has been proved that the symptoms—rapid heart, increased excitability, steadily mounting metabolism, with loss of weight—all disappear on the removal of the thyroid gland on the operated side. The metabolism, which had increased approximately 100%, dropped down to within normal limits. Whereas the other animals having the induced disease had died within three months of the first appearance of the symptoms, this animal lived normally for seven months after the operation and was then purposely killed.

The thyroid gland is subject to that division of the nervous system which is brought into action in emotional excitement, and which causes adrenal secretion. It is probable, therefore, that the thyroid, like the adrenal, has, normally, functions which are performed in times of critical emergency. It may be that such an emergency function is an exaggerated form of the routine activity of the gland.

## IV.

## THE CLINICAL VALUE OF METABOLIC STUDIES OF THYROID CASES.

By WALTER M. BOOTHBY, M.D., BOSTON.

[From the Surgical Service and Respiration Laboratory of the Peter Bent Brigham Hospital, Boston.]

THE brilliant researches of Lavoisier on the nature of oxygen, carbon dioxide, and heat led him to propound the fundamental proposition that the life processes were those of oxidation with the production of heat,—and thus to found the science of metabolism.

Since then it has been demonstrated that the complete combustion of substances in the body is not only qualitatively, but quantitatively, identical with the burning of those substances outside the body. Consequently it is now possible to calculate the amount of heat produced by the metabolic processes from a knowledge of the oxygen consumed and the carbon dioxide eliminated in a given time.

For clinical purposes these factors for calculating the heat-production can be determined with a high degree of accuracy by collecting, measuring, and analyzing the expired air.

In order to compare the heat production of one patient with that of another, it is necessary to eliminate such disturbing factors as muscular activity and the stimulating action of food. Hence absolute rest and abstinence from any nourishment for at least twelve hours before the determination are essential. The heat-production obtained under these conditions is known as *basal metabolism*.

The general application in the clinic of metabolic data has not, until very recently, been of much practical value, because the comparative standards used showed wide variations in the basal metabolism of normal people. This problem is not even now completely solved, but DuBois<sup>1</sup> has shown that, when compared by surface area determined by a height-weight curve proposed by him, the basal metabolism of normal people rarely varies more than ten per cent. from an average figure, the latter depending on age and sex.

Some six hundred determinations of the basal metabolism have been made on one hundred and forty patients during the past year in the Respiration Laboratory of the Peter Bent Brigham Hospital. The cases studied have been those in which chronic metabolic disorders were a possible factor in the production of the symptom-complex, as well as a considerable proportion of traumatic and miscellaneous cases for comparison.

We have found that convalescent, post-operative cases of acute appendicitis, hernia, varicose veins, alveolar abscess, and similar conditions, with normal temperature, after varying periods of recumbency, have shown, with one exception, a basal metabolism which does not vary more than ten per cent. from Du Bois' normal, and in

the majority of cases the metabolism is within five per cent. of his normal figure.

The patients in whom we have found an abnormal variation in the basal metabolism are those in whom involvement of an endocrine organ could either be established or considered as a possibility.

The endocrine organs furnish a series of substances, designated by Schaefer<sup>2</sup> as autacoids, which enter into the blood stream and act on certain body cells, either exciting or depressing their functions. For normal metabolism, Paton<sup>3</sup> believes that a certain amount of each autacoid is essential and that some proportion between the amounts of each must be maintained.

Abnormal variations in the amount of some of these autacoids are known to speed up or to slow certain cell activities, producing definite pathological conditions with a corresponding alteration in the basal metabolism. It has been possible, therefore, to explain many metabolic diseases like myxedema, acromegaly, and exophthalmic goitre, by alterations in the quantity or character of the secretion produced by an endocrine organ.

No factors other than the autacoids have yet been discovered which are known to influence basal metabolism, with the possible exception of the toxins in fevers. Therefore it seems logical to reverse the accepted theory and, except in the case of infections, to suggest the tentative hypothesis that a variation of the basal metabolism beyond normal limits is due to an abnormality in the secretion of one or more of the endocrine organs. The particular autacoid must then be sought for by characteristic localizing symptoms and by the elimination of those autacoids, variations of which produce well-known signs and symptoms.

This hypothesis allows a clear-cut division to be made between diseases in which the metabolism is increased, decreased, or remains normal, together with the probable cause of the disordered metabolism. Such a division is fundamental because it is made on an accurate knowledge of the rate at which the body cells are actually living. It will, therefore, serve as a foundation on which the subsidiary objective and subjective symptoms can be superadded, thus aiding in differentiating into distinct disease entities some of the present confused clinico-pathological groups, like the anemias and chronic nephritis. In both of these ill-defined groups we have found, as might be expected, marked divergence in the metabolic findings. Such variations are not to be looked upon as accidental or inconsequential—they must be considered as absolutely fundamental.

Important as is the diagnostic value of metabolic studies in endocrine disorders, of no less importance is their value in determining the proper method of treatment, since conditions of over- or under-activity require different therapeutic measures. The determination of the



basal metabolism before, during, and after treatment, will give in mathematical terms, easily understood, the value of that treatment. It will indicate whether the procedure has been beneficial or, on the other hand, harmful.

Diseases of the thyroid gland, with their extreme variations in the basal metabolism, afford a most striking example of the significance of metabolic studies. Furthermore, the connecting link between the etiological cause and the clinical picture is, in these diseases, most evident. In conditions of thyroid overactivity the metabolism may increase to one hundred per cent. above normal, and in conditions of underactivity it may be decreased to fifty per cent. below normal. Moreover, we have found that the patient's condition, judging from the sum total of the objective and subjective symptoms, corresponds very strikingly to the numerical expression of the basal metabolism.

The following case is illustrative.

C. W., aged 23, candy dipper, unmarried. Entered the hospital June, 1915, for chronic appendicitis. At that time the thyroid gland was described as somewhat enlarged but no constitutional symptoms were noted. In February, 1916, she re-entered complaining principally of swelling of the neck with very slight pressure symptoms. There had been progressive loss of weight from 123 to 105 pounds. Her skin was moist and red. She had slight psychic symptoms. The eye symptoms were practically negative, there being only a questionable exophthalmos. The slight tremor of fingers and tongue present increased under excitement. Her pulse was not particularly rapid, being seventy at rest, although it increased markedly on exertion. There was fullness of the neck and the thyroid lobes were palpable, but there were no thrills or bruit. The basal metabolism at this time was twenty-eight per cent. above normal. Partial thyroidectomy resulted in (Dr. Jacobson) improvement in the clinical symptoms. Patient was discharged eight days after operation. Her metabolism had then become normal. She returned to work and on re-examination six weeks later the metabolic findings were still normal.

In this case the diagnosis lay between a small colloid non-toxic goitre in a patient with slight nervous temperament from other causes and the early stages of a mild type of toxic non-exophthalmic goitre. The latter interpretation was definitely made by the metabolism studies, which showed an increase to twenty-eight per cent. above normal. Immediate operation was therefore advised; expectant treatment would have been permissible only if the metabolism had been normal. The operation was done consequently before the thyroid toxemia had produced any profound and long-lasting constitutional disturbances; hence recovery was correspondingly prompt and no long post-operative rest was necessary for recuperation.

No such rapid recovery occurs in patients in whom the thyroid intoxication has been of sufficiently long duration to produce profound secondary constitutional disturbances.

The following case illustrates a slow but complete recovery:

A. J., aged 33, housewife, entered hospital in September, 1915, presenting symptoms of moderately severe exophthalmic goitre of at least eleven months' duration. The basal metabolism was determined and found to be thirty-five per cent. above normal. Partial thyroidectomy (Dr. Homans) resulted in a general clinical improvement and fourteen days after operation the metabolism decreased from thirty-five to twenty per cent. above normal. After discharge from the hospital the patient went South and rested for two months in bed; she gradually increased her exercise and in another month considered herself well, excepting that she was then subject to debilitating attacks of tonsillitis. Seven months after operation she returned for examination and the metabolism was found to be normal and she appeared in every way completely cured.

In some instances complete recovery may not occur because too small an amount of the gland is removed. This is most likely to occur in the especially severe cases, whose precarious condition prevents a more extensive operation. Repeated metabolism studies will determine when the full extent of the improvement is reached, and thus furnish definite information both as to the necessity and the opportune time for the subsequent operation.

M. D., aged 21, married. Entered the hospital in March, 1916, with symptoms of very severe exophthalmic goitre. Her metabolism was determined and found to be ninety-eight per cent. above normal. Rest in bed for four weeks resulted in almost no improvement, the metabolism then being eighty-nine per cent. above normal. Partial thyroidectomy (Dr. Cheever) resulted in considerable improvement. The metabolism increased to sixty-seven per cent. above normal. Patient was then discharged. After her return home she failed to rest and in addition had a very severe attack of tonsillitis. Six weeks after discharge she returned for examination. Her metabolism was found to be still very high—fifty-four per cent. above normal.

It is too early to predict the outcome of this case; it seems unlikely, however, that simple rest treatment will be sufficient. She is, however, naturally anxious to avoid a second operation; delay is advisable as long as improvement continues,—an improvement definitely determined by metabolic studies at frequent intervals.

This patient, as well as several others, received no benefit from simple rest treatment; one case even showed an increased metabolism.

A. E. H., age 25, male, entered hospital October, 1915, with symptoms of quite severe exophthalmic goitre, apparently initiated by a recent acute Neisser infection. The basal metabolism was found to be fifty-six per cent. above normal. After twenty days' rest in bed the clinical symptoms appeared more marked and the metabolism had increased to seventy per cent. above normal. Partial thyroidectomy (Dr. Homans) brought the metabolism down to forty-two per cent. above normal, and six weeks later, after

further rest together with x-ray treatment, the metabolism decreased to thirty-six per cent. above normal. He was then discharged and was shortly able to go to work; by letter he reports that he is doing well and is gradually getting stronger.

This patient, like A. J., probably would become entirely well under prolonged rest treatment. But he could not afford this. Economic conditions may, therefore, suggest the advisability of a second operation on those cases whose metabolism remains elevated and whose financial condition prevents prolonged rest.

The following case illustrates the opposite type of thyroid dystrophy.

M. J. B., aged 62, unmarried. Entered February, 1916. There was marked edema of the eyelids and moderate edema of the extremities. The skin was dry, but not especially thickened; almost complete loss of hair. The temperature, pulse, and respiration were subnormal, and patient was exceedingly drowsy. Urine, acid, 1.015; very slight traces of albumin; no sugar, few squamous and white blood cells; occasional red blood cells; and a few finely granular casts. Special renal tests showed very low function. Metabolism very markedly decreased to forty-seven per cent. below normal.

Under intermittent small doses of thyroid, the patient very slowly improved. Within two months metabolism had increased from forty-seven per cent. to fifteen per cent. below normal. Thyroid was then discontinued as patient was showing signs of irritability.

One month later the metabolism was again determined and found to be slightly lower—twenty-two per cent. below normal.

The clinical improvement in this patient from thyroid treatment was most marked and exceedingly striking. The albumin and casts have disappeared from the urine, and there has been some improvement in the renal function tests.

This case is most suggestive because two clinical entities were apparently present,—the myxedema and the chronic nephritis. Under thyroid treatment the myxedema greatly improved; likewise the albumin and the casts disappeared from the urine. The thyroid autacoid probably plays a very important part in regulating the protein metabolism, some of the steps of which Kendall<sup>4</sup> has recently been able to point out. It is not improbable, as in the above case, that a mild condition of myxedema may sometimes be mistaken for a chronic nephritis; in doubtful cases, therefore, the determination of the basal metabolism would materially assist in establishing the correct diagnosis.

#### SUMMARY.

1. Basal metabolism for clinical purposes can be obtained with a high degree of accuracy by collecting, measuring, and analyzing the expired air.

2. In normal people the basal metabolism rarely varies more than ten per cent. from a

normal figure, depending on age and sex, when compared by surface area, determined by Du-Bois' height-weight curve.

3. Several cases of thyroid dystrophies, in which the basal metabolism was determined, are cited to illustrate its value in diagnosis and in determining the proper method of treatment.

#### REFERENCES.

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#### V.

#### PARTIAL THYROIDECTOMY WITH LOCAL ANESTHESIA, SCOPOLAMINE AND MORPHIA.

By FRANK H. LAHEY, M.D., BOSTON.

MANY of the factors in the production of exophthalmic goitre are gradually having light thrown on them by men like Dr. Kendall and similar painstaking investigators, and the knowledge gained of other ductless glands, owing to the interdependence of all, has done much to advance our knowledge of processes relating to thyroid functioning. The subject of ductless glands involves so many different fields,—chemistry, physiology, and pathology,—that other than for a trained investigator, or one interested enough in the subject to digest it patiently, the following and comprehension of the literature relating to investigations on these glands is not an easy thing. Therefore, you as clinicians may rightly say: "For us it is sufficient that the disease exists. What shall we do for it?" My answer would be, "surgery," in the light of all experience up to the present time.

The disease, untreated, has a very definite mortality,—stated by some radical writers as high as 29% in cases observed over a period of ten years,—and results in the remainder in varying degrees of incapacity and discomfort. A small percentage of cases result in spontaneous cures. Surgery offers a mortality of from 2 to 7% and a percentage of cures of from 50 to 70%, and improvement in from 20 to 30% of the remainder. To my mind there is no question that surgery offers by far the quickest and surest way to recovery. Comparing the mortality of untreated with the operated cases, it is my opinion that, even accepting the high mortality mark of 7%, the eventual risk is less with operation than with medical treatment.

Having demonstrated to myself that surgery is the treatment of choice in these cases, it became my aim to reduce the mortality of that method of treatment to its lowest possible point in my hands. So, after the occurrence of two

deaths in a series of goitres operated upon by me with ether, I undertook to accomplish the operation entirely by means of local anesthesia. This I was able to do, but not without causing pain and great excitement, both factors, I believe, intimately connected with the mortality of this disease. I then added scopolamine and morphine to my procedure, and now believe that I have a method of operating upon the thyroid that is safer than any of the other methods.

I have records of fifty-nine consecutive goitre operations performed by me with this method. In this series there not only has not been a death, but there has not been anything to worry about during or after the operation. In reporting these cases, I am reminded that I may have had extraordinary good fortune, and that sooner or later I may begin to have a mortality. To this I would say that I do not believe or claim that thyroid cases will not die with this method. I believe, however, that but few will; and do say that I have not refused, or put off, operation in any case seen by me during the time when this series was being done. In other words, these cases have not been selected cases, but have been taken as they came; further, that but one of these cases was a pole-ligation,—all others being complete operations. The pole-ligation was later subjected to complete operation with this method.

There have been four failures, in that ether was given in two cases, and should have been given in two more. Two required gas,—one for not more than a minute, and one but a few bagfuls. One more required a few whiffs of ether. I believe that the veronal, scopolamine, morphia, novocaine and adrenalin sequence is the ideal method for operation upon the thyroid gland. The veronal, scopolamine and morphia largely do away with psychical irritation before, during, and after the operation, and produce a sufficient blunting of the sensory nerves to fill up the gap so necessary in extensive operation with novocaine alone. The absence of ether removes an element distinctly detrimental to the chromaffine system, which is so intimately connected with blood pressure, the adrenal, and the sympathetic system,—a system closely related, as shown by Cannon's experiments, with the activity of the thyroid gland. The morphia and scopolamine, again, provide peaceful sleep for a considerable time following the operation.

I feel that one of the strongest indications, aside from the fact that this series of cases has been free from mortality, is the fact that there are but mild so-called "goitre storms" after operations by this method, and in many cases, none at all.

This method will fail in about one out of ten cases, because of the failure of scopolamine and morphia properly to affect these individuals. Even in the complete failure, it will, however, provide mental quietude up to the time of

the administration of gas, if it becomes necessary, and also after it.

This method requires better technique than that with ether; requires more time, and infinitely more patience. Therefore it will never become popular in the hands of a large number of surgeons. I feel sure, however, that in the hands of the few who will be interested in it, it will eventually prove itself superior to other methods. Even though I lose cases, I shall still be convinced that this method, which permits of partial thyroidectomy without the preliminary psychical excitement associated with gas or ether, is the one directed along the right line.

#### ADMINISTRATION.

At eight o'clock of the night previous to operation, ten grains of veronal are administered. On the next morning, two hours previous to the time of operation, 1/200 of scopolamine and from 1/6 to 1/4 of morphia are administered hypodermically. One hour later, provided stertorous respiration, irregular pulse, or excitation have not appeared, this dose is repeated. At the time of operation, one hour later, if the patient is not soundly sleeping, 1/400 of scopolamine without morphia is administered. The solution of novocaine is then prepared. A 2% solution of novocaine containing 15 minims of adrenalin to the ounce has proven in my hands most satisfactory. One rarely needs to use more than 1/2 ounce, and no untoward symptoms have occurred in this series of cases, either from novocaine of this percentage or from the administration of morphia and scopolamine.

#### SLIDES.

*Slide I.* Shows the method of making the skin injection with the fingers pinching up the skin so that one may be sure that the injection goes into, and not beneath, the skin. It also shows the U-shaped incision, which I much prefer to the collar incision, as it permits of easy access to the superior thyroid vessels. I much prefer to tie these vessels first, as the upper part of the gland then peels out of its capsule easily, allowing that structure to be clearly demonstrated while the branches of the inferior vessels are clamped and cut.

*Slide II.* Shows the method of separating the platysma from the underlying veins, which are adherent to the sterno-hyoid and thyroid, and only loosely attached to the overlying platysma.

*Slide III.* Shows the infiltration made along the anterior borders of the sterno-mastoid and in the median line at the junction of the sterno-hyoids and sterno-thyroids, also the flap turned up so that one may see the ease of access which will be had to the superior thyroid vessels.

*Slide IV.* Shows the superior vessels tied on one side and the upper portion of the gland mobilized, clamped and ready to be cut away, on

the right side, the gland turned bottom side up, and the capsule demonstrated and pulled away from the outer edge of the gland.

*Slide V.* Shows how the cut surface of the gland is sutured over.

*Slide VI.* Shows the relation of the portion of gland left to the whole gland.

*Slide VII.* Is a drawing of a dissection of the gland made under my direction, showing the relation of the posterior surface of the gland to the recurrent laryngeal nerves, the course of the inferior thyroid artery from behind the common carotid up to its insertion into the gland and the relation of the thyroidea ima artery to the gland.

# VI.

## THE TREATMENT OF GRAVES' DISEASE BY THE ROENTGEN RAY.

By MALCOLM SEYMOUR, M.D., BOSTON.

[From the Medical Service of the Massachusetts General Hospital.]

THE treatment of Graves' disease by the roentgen ray has been used for many years. Uniform results have not been obtained until recently. This has been due to the inaccuracy in dosage, resulting either in no action or in serious burns, so that the treatment has been unsatisfactory and often dangerous.

The action of the roentgen ray on some of the ductless glands of the body has been observed for a long time. Its effect on the testicle and ovary is now common knowledge among the profession. Its atrophic action on the thyroid, thymus and pineal has recently received considerable study.

It is a well-established fact, that the highly specialized epithelial cells are the first to succumb to the action of the roentgen ray, and, furthermore, the more closely these cells approach the embryonal type, the more easily is their destruction accomplished. Therefore, when the pathological histogenesis of the thyroid and thymus gland in Graves' disease is borne in mind, it can readily be seen that in the roentgen ray we possess a therapeutic agent of undoubted efficacy in the treatment of this disease. This is further borne out by the large number of cases in Europe and America that have been successfully treated by men who are thoroughly familiar with the technic of roentgen therapy. F. A. Stoner treated 41 cases, with only one failure. Some of these cases were under observation from one to four years, with no sign of returning symptoms.

Ludin collected 208 articles on this subject, showing that the roentgen ray had a favorable influence on Graves' disease. In general, it was found that the longer the duration of the symptoms, the more treatment was required to cause their abatement and disappearance. He also

found that there was little foundation in fact for the claim that the rays caused such changes in the capsules of the glands that made operation difficult. It is now being noted, that frequently operations for thyroidectomy are complicated by so-called thymus deaths or status lymphaticus. Most surgeons insist that the thymus should be investigated and resected at time of operation so as to prevent the above condition.

We have, at the present time, under treatment at the Massachusetts General Hospital, 144 cases of Graves' disease. Treatment of most of these cases has been going on since August 1, 1915. Of these 144 cases, 80 have been given at least two treatments. The average number of treatments received has been four. The duration of the treatments has been from two to eight months, the average being three and one half months. Of the 80 cases which have been treated, all have shown improvement with the exception of seven. Of these seven cases, three have received two treatments, three have received three treatments, and one has received four treatments. In one of these cases the disease is complicated by asthma, and one has active pulmonary tuberculosis. Five cases showed no change. Four were born in Russia, and although the pulse rate is lowered and the tremor has largely disappeared, they will not admit that they are improved, and complain of indefinite aches and pains throughout the body. One case has had three treatments, and shows absolutely no change. Of the eighty cases, eight were absolutely cured of their symptoms. Nearly all have gained in weight. The average gain has been seven pounds, one case having gained twenty-five pounds. The pulse rate has been lowered in all but a few cases, the average being twelve beats. The greatest lowering in pulse rate was 52 beats, from 146 to 94. In this patient, the symptoms were very severe, with marked exophthalmos and tremor, and a moderately enlarged tumor of the gland. She had five treatments. The tremor has disappeared, the exophthalmos has practically gone, the circumference of the neck decreased one-half inch, and she feels perfectly well.

The method of treatment has been as follows: The neck has been divided into three areas,—right, left and middle or suprasternal,—and the treatment directed to these areas. A Coolidge tube has been used. The average dosage has amounted to about 4 H., which equals 5 Holzknecht or 10x Kienbock or 1B Sabouraud-Naire. This is the dose necessary to produce a slight erythema. Some writers state that an erythema dose is too severe, but we have not found this to be so. It seems advisable, however, to keep just below the erythema dose so as not to cause any skin irritation, inasmuch as it seems evident that repeated erythematous doses may cause vessel changes in the skin covering the tumor, or the tumor itself.

In all cases, the target of the tube was at a distance of 10 inches from the skin, and a filter of 4 mm. of aluminum and 1 thickness of sole leather was interposed. The dose has not been repeated inside of three or four weeks. Under general treatment, most of the patients have not changed their modes of living, excepting the diet, which has been increased or favorably rearranged, and treatment has been directed towards anemia, which has been present in a considerable number of cases.

The diseases of the thyroid gland have recently been studied with particular interest, since the level of the total metabolism seems to be the best index of the activity of the thyroid secretion. DuBois found in a cretin who was 36 years old, the total energy requirement was from 18 to 25% above the normal, but was raised almost to the normal on the third day of treatment with thyroid extract.

In a recent study of the metabolism of hyperthyroidism, Dr. J. H. Means, of the Massachusetts General Hospital, has found in a series of nine cases of typical exophthalmic goitre, that the metabolism in all of them showed a marked rise, anywhere from 30 to 80% per square meter of body surface, using the Du Bois formula for surface area of body, and still more per kg. of body weight, this latter being due to the great emaciation which many of them show.

This marked rise in hyperthyroidism is very interesting because, so far as is known, so marked a rise occurs in no other condition in which fever is not present. These patients were all afebrile when studied.

In addition to the fact that an increased heat production is a characteristic of hyperthyroidism, there seems to be good evidence that the severer the intoxication, the higher the metabolism.

During the study of these cases, our attention necessarily centered on the region of the body nearest the thyroid gland, and in making the routine observations as to size of the gland, etc., various bony abnormalities were encountered. Five cases of extra-cervical ribs were observed among the 144 cases studied, four being found during the physical examination, and one by the x-ray. All were without symptoms which might have been caused by this abnormality.

#### CONCLUSIONS.

All writers on the subject of x-ray treatment of hyperthyroidism have come to the following conclusions: The pulse rate is nearly always reduced, and this, almost always at once. The tremor and nervous symptoms improve from the start. The gland rapidly diminishes in size in some cases, remains unaffected in others, but if hard, tense and throbbing, the throbbing diminishes and the gland becomes softer. The body weight practically always immediately increases.

Advantages of this treatment:

1. There are no fatalities.
2. There is no resulting scar, as after operation.
3. It does not interfere with the patient's occupation.
4. It is painless and causes very little inconvenience to patient.
5. If unsuccessful, an operation may be done with less risk, because of the favorable action of the x-ray on the thymus gland.

The x-ray treatment of Graves' disease should not be undertaken except by those thoroughly experienced in roentgen therapy. The dosage must be accurately measured, for if the rays are applied in a haphazard manner without knowledge of the total dosage, the result may be unsatisfactory, resulting in serious burns or in total destruction of the gland, causing myxedema.

The diagnosis of hyperthyroidism is frequently overlooked, and is mistaken for so-called neurasthenia, and is especially confused with early pulmonary tuberculosis.

#### Original Article.

#### THE EXCRETION OF HEXAMETHYLENAMIN BY DAMAGED KIDNEYS.\*

BY GEORGE GILBERT SMITH, M.D., BOSTON.

[From the Genito-Urinary Department, Massachusetts General Hospital.]

IN the management of renal infections, the medical profession has been accustomed to place considerable confidence in hexamethylenamin. This drug is excreted by the kidney and is broken up by acid urine into ammonia and formaldehyde. Despite the conclusions of some investigators, who allege that the splitting off of formaldehyde does not occur until the urine has reached the bladder, clinical experience has taught some of us that renal infections of the most severe type can be controlled and perhaps cured by the administration of urotropin.†

It is somewhat disturbing, therefore, to read in a paper by Falk and Sugiura, issued from the Harriman Research Laboratory of the Roosevelt Hospital, that "in a number of pathological cases involving impairment of kidney function, abnormally small amounts of hexamethylenetetramine were excreted." Their results have apparently been taken by some genito-urinary surgeons as applying to all damaged kidneys. If their statement is generally

\* Read at the annual meeting of the American Association of Genito-Urinary Surgeons, Washington, D. C., May 9, 1916.

† The words "urotropin" and "hexamethylenamin" are used interchangeably in this paper, although hexamethylenamin was the drug used in our experiments.



true, urotropin must be placed on the shelf along with the other false hopes of the pharmacopeia.

It seemed to us important to investigate this question. In the first place, upon what evidence do Falk and Sugiura base their conclusions?

They determined the quantity of urotropin by a method which depends upon the precipitation of urotropin by the addition of an alcoholic solution of iodine. This test does not take into consideration the free formaldehyde which may be present (personal communication from Falk).

This seems to us a possible source of error. Some of the specimens were examined by Falk and Sugiura a good many hours (at least 20) after they were voided. During this period, if the urine were acid, a splitting-up of the urotropin present undoubtedly was going on. The writers partially cover this point by saying that if the test for hexamethylenamin is "negative or doubtful, the test is confirmed by acidifying a few cubic centimeters of the solution with sulphuric acid, warming, and then testing with phloroglucin and alkali for formaldehyde." The absence of the latter, they conclude, "proves conclusively the absence of hexamethylenetetramin."

We would answer this point in two ways. First, they apply this acidifying test only when the test for urotropin is "negative or doubtful." If urotropin is present in small quantities, they do not use this control. Secondly, the test for formaldehyde which they employ seems inadequate. In the 40 observations on normal urines given by them, there is one strong test for formaldehyde, one "faint to strong," and three "fair." All the others are faint, very faint or negative. The work of Burnam and my own work upon the question of the presence of formaldehyde in urine gave a much larger proportion of positive results. We used the phenylhydrazine, sodium nitro-prusside and sodium hydrate test; they used the phloroglucin and alkali test.† The point is a difficult one to make clear without further data, but it seems that if the test used by Falk and Sugiura gave only 5 positive results out of 40 observations on normal urine, it cannot be relied upon as a control for the excretion of hexamethylenamin.

If the urine to be tested contains albumin, it must be submitted to the following process before the estimation can be made. "An equal volume of methyl alcohol is added, the mixture allowed to stand one or two hours at room temperature, filtered by decantation through folded filter paper, evaporated to one-third the volume in a current of air or under diminished pressure."

It has been shown that urotropin dissolved in acid urine and allowed to stand for several

hours at room temperature will be partly broken up, and that the urine will then give a definite test for free formaldehyde. It seems to us highly probable that during the process of filtering and evaporation, through which albuminous urines are put in Falk and Sugiura's test, the urotropin, at least in part, is converted into formaldehyde, and the latter, being simply a gas in solution, escapes. Urine from damaged kidneys is usually albuminous; it is this urine which is subjected to the preceding test. These investigators do not mention control experiments upon normal urine to prove that the process does not drive off urotropin in the form of formaldehyde; it appears to us justifiable to believe that the test itself, which is not the same for normal and for albuminous urines, may be one cause of the apparently diminished urotropin content in urine from damaged kidneys.

Falk and Sugiura applied their quantitative test for urotropin to the urines of various normal individuals, and found that the ingestion of one gram of urotropin was followed by the excretion in the urine of quantities of the drug varying from 11% to 74% of the amount ingested; that in general the absolute amount of urotropin excreted by the kidneys increased as the specific gravity of the urine decreased. "The lower the specific gravity of the urine, the larger was the amount of hexamethylenetetramin excreted." They do not attempt to explain this phenomenon, but apparently regard it as being connected in some way with the kidney. They do mention the possibility of its being due to differences in the absorption of the drug by the gastro-intestinal tract. To us, this seems to be the explanation. The normal kidney is remarkable for the uniformity of its work; upon this quality the various functional tests depend. To secure uniform results, however, a definite quantity of the substance used must be introduced into the blood-stream; the factor of absorption from the gastro-intestinal tract at once diminishes the accuracy of the test as a measure of renal function.

It is highly improbable that the healthy kidney which excretes the test drugs with such uniformity, behaves in so capricious a manner towards hexamethylenamin. It is highly probable, on the other hand, that varying conditions in the gastro-intestinal tract—the presence of food, the acidity of the gastric juice, the amount of fluid in which the drug is diluted—alter in the same individual the amount of urotropin which is absorbed. Quite possibly the ingestion of much water aids in the absorption of urotropin, thus accounting for the observation that high urotropin excretion and low specific gravity go hand in hand.

The low output of urotropin by some of the pathological cases cited by Falk and Sugiura may be due to conditions affecting the metabolism of the entire body, such as anasarca or a state of impending death, which must have

† In my experience, Burnam's test has shown itself three or four times as delicate as the phloroglucin test. This does not agree with the findings of Hanzlik and Collins, who consider phloroglucin the more delicate. (Hanzlik and Collins, Arch. of Int. Med., 1913, Vol. 15, p. 578.)

greatly diminished the absorptive powers of the stomach and intestines.

The output of the drug was studied by Falk and Sugiura in 24 pathological cases. One gram was given, and the urine collected for the next 12 or 24 hours. Nine of the cases (15, 17 to 24) were under treatment for diseases—tuberculosis of the knee, leukemia and syphilis of the brain for example—which had no particular connection with the kidneys; three others, (13, 14, and 16) had arteriosclerosis, which might possibly have had renal manifestations. Of these 12 cases—half the series—there is no evidence presented to show that there existed any real damage of the renal tissue. In three of them, indeed, we are told nothing whatever about the renal condition. Yet of these 12 cases, only two show an output of urotropin greater than 13%. Four of them show only a trace.

The other 12 cases are all renal—one nephropoiesis, one septic infarct (unilateral), one amyloid kidney. The other nine are chronic interstitial or cardio-renal cases. They excrete urotropin rather better than do the twelve with healthy kidneys—27%, 86%, 79%, 24%, 61% are the five best outputs. Of the others, two who died put out only a trace, and one with a retained nitrogen of 164 and a phthalein test of 0, put out none.

Careful study of this series of observations fails to show any constant relation between the renal condition and the output of urotropin. The amount of urotropin excreted averages less than in the series of healthy kidneys; that may be due to the effect of the test itself when applied to albuminous as contrasted with non-albuminous urines, or may be due to the poor absorptive powers of many of the pathological cases. One would hardly expect a patient in the last stages of leukemia to have a very robust metabolism.

The evidence produced by Falk and Sugiura does not warrant the conclusion that damaged kidneys do not excrete urotropin in sufficient quantity to be of bactericidal value.

In order to test this point still further, we have examined the urines of 14 patients whose kidneys were unquestionably damaged, many of them to a marked degree.

Not being proficient enough to employ the test used by Falk and Sugiura, we have had to rely upon the test for formaldehyde described by Burnam. As a rough measure of the concentration of the formaldehyde, positive urines were diluted until they no longer gave a positive test. The last dilution giving a definitely positive test we took to be a 1-300,000 solution, since formaldehyde added in known quantities to normal urine ceased to give a positive test when diluted beyond this point. By dividing 300,000 by the number of dilutions, the approximate strength of the original solution was arrived at. This method, unfortunately, was suggested only towards the end of the investigation, and was employed only in a portion of the cases.

The cases studied fall into two groups:

- (1) the "surgical" kidneys resulting from renal calculus, obstructing prostate, etc., and
- (2) the "medical" nephritis of chronic interstitial or glomerular type.

Ten cases with kidneys damaged by infection were studied. The evidence of bilateral damage was found in the decreased phthalein output plus the clinical history. Seven of them were old men of the prostatic class; one was a bilateral pyelitis, one bilateral renal calculi, one a rather obscure case of a septic infarct or eclamptic kidney. The prostates had been taking urotropin gr. x four times a day for varying periods; the others had been given gr. xv three or four hours before the urine was collected. Of these 10 cases, the urine contained free formaldehyde either before or after boiling with sulphuric acid (depending largely upon the acidity) in quantities sufficient to give a moderately positive test (dark green with Burnam's method) in 4 cases, and a strongly positive test (bluish or blackish green) in 6 cases. Of the strongly positive cases, the strength of formaldehyde present, estimated by the dilution method, was 1-40,000 once, 1-30,000 twice, 1-10,000 three times. The strength of the moderately positive tests was probably not more than 1-60,000 to 1-100,000.

Perhaps the case most strikingly illustrative of the ability of damaged kidneys of this type to excrete urotropin was that of Mrs. L., aged 52, whose x-rays showed huge calculi in both kidneys. After the intramuscular injection of 1 c.c. phenolsulphonaphthalein solution, no color appeared in the urine for 35 minutes. In the hour following the appearance of the color, less than 5% of the dye was excreted. She had been taking urotropin gr. xv three times a day for several weeks, and the urine showed a urotropin content of at least one part in 10,000.

From the study of this group of ten cases, all of whom had that type of kidney disease which is usually treated by urotropin, we do not find evidence that the output of urotropin is reduced below the point of efficiency.

Examination of four cases of the nephritic type, however, gave different results.

CASE 1. Age 58. Chronic glomerular nephritis, with phthalein excretion of 20% first hour and 25% second hour, non-protein nitrogen of 42 mgm., after one dose of gr. xv urotropin, excreted urine containing free formalin in very strong concentration. (Bluish black color.)

CASE 2. A girl of 26, with good function, 40% first hour, and 10% second hour, non-protein nitrogen of 32 mgm., and a diagnosis between chronic glomerular nephritis and kidney destroyed by some antecedent inflammatory process, put out neither urotropin nor formaldehyde within four hours after taking gr. xv of urotropin.

CASE 3. A woman with chronic glomerular nephritis, less than 5% phthalein excreted in two hours,

and 14 mgm. non-protein nitrogen, put out only the slightest trace of urotropin 10 hours after a dose of gr. xv, and none at all after two doses 16 and 4 hours previously.

CASE 4. A man of 46, with probable bilateral polycystic kidney, phthalein excretion of less than 5% in two hours, and non-protein nitrogen of 97 mgm., excreted only a small amount of formaldehyde (moderately positive test); this appeared 5 hours after ingestion of the drug.

In a previous paper on the excretion of formalin in the urine, I stated that "the kidneys of chronic nephritis, to judge from a few observations, excrete urotropin much more slowly than do normal kidneys. One dose of grains xv has given traces of formaldehyde in the urine for 36 hours." From the very limited number of cases of nephritis which we have studied in this connection, it would appear that serious disease of the glomeruli greatly decreases the ability of the kidney to excrete hexamethylenamin. If this is true, the diminished excretion of this drug in chronic glomerulo-nephritis should not affect the position of hexamethylenamin in the treatment of renal infections. According to Cabot and Crabtree, colon infection affects the epithelium of the tubules. Excretion of hexamethylenamin by the glomeruli is not interfered with, and the drug, as we have shown, is put out in good quantity.

In view of the above findings, we believe that the statement of Falk and Sugiura in regard to the low output of hexamethylenamin by kidneys with impaired function is of very little practical importance. Close analysis of their paper shows several probable sources of error in their procedure, and these errors all tend to represent the urotropin output as less than it really is. Of the 24 pathological cases studied by them, 12, or one-half the number, fail to present evidence of any value pointing to true renal disease. These 12 cases, furthermore, show a lower output of urotropin than do the 12 cases of renal disease in the same series.

No conclusions as to the value of urotropin in those cases in which it might be expected to do good can be drawn from the work of Falk and Sugiura.

As positive evidence on the question of the output of urotropin by infected kidneys we have presented facts drawn from a study of 10 cases of undoubted renal disease of this type. In every case urotropin was excreted; in three cases, in a strength of 1-10,000; in two, 1-30,000; in one, 1-40,000. It was weaker in the other four, although strong enough to give a definite test with Burnam's method. In chronic nephritis of advanced degree, we have found in three cases a diminution in the output of urotropin which would be a serious factor in its employment as a therapeutic agent. Fortunately, in such cases it need seldom be employed. In kidneys damaged by infection, even to a very marked degree, the drug may be excreted in a strength as high

as 1-10,000. One must bear in mind the very important fact that no matter how much urotropin is excreted, it will be useless as a bactericide unless it is broken up into formaldehyde by urine which is definitely acid.

We wish to acknowledge our indebtedness to Dr. W. Denis, Director of the Chemical Laboratory at the Massachusetts General Hospital, for much valuable assistance, and to the Medical Staff for the use of their cases.

## THE ILEO-CECAL VALVE AND THE CHRONIC INTESTINAL INVALID.

### A PRELIMINARY NOTE ON VALVULAR INCOMPETENCE WITH CASE REPORT DEMONSTRATING SUCCESSFUL NON-SURGICAL THERAPY.

BY JOHN BRYANT, M.D., BOSTON.

The existence of the ileo-cecal valve was first noted by Posthius in 1566; four years later, Varole stated that its function was to prevent regurgitation of faeces into the small intestine. Piccolomini in 1586 produced experimental incompetence of the valve. Good, 336 years later, stated that the second main function of this muscular valve is to moderate the flow of the contents of the small intestine into the colon. After an additional 75 years, Hertz in 1897 recognized clinically the existence of incompetence of the valve, and treated it medically with some success.

Cole, in 1902, demonstrated incompetence by the bismuth-roentgen method, and has since stated that clinical symptoms vary in intensity with the degree of incompetence present. Macewen in 1904, on the basis of direct observation in the human, deduced the existence of the pyloro-ileo-cecal reflex, later proved by the physiologists; he also clearly described a type of indigestion resulting from too rapid passage of food products through the valve, and described the effects of mental states upon its action.

Yet, for the most part, knowledge of the ileo-cecal valve has been conspicuous by its absence. Thus, even standard anatomies of today are content to perpetuate error in the little they do say about it, by dismissing the valve as a purely mechanical affair.

The last three years, however, have seen a renewal of interest in the actions of this small but interesting structure, as witness the writings of Kellogg, Case, Cannon, Elliott, Rutherford, and others. It is at least now proven that the ileo-cecal valve

- I. Is normally competent after infancy.
- II. Should constitute an effective break in continuity between the very dissimilar, even if adjacent, processes of putrefaction and absorption.

- III. Is an active muscular as well as a passive mechanical structure.
- IV. Is responsive to both nervous and chemical stimuli.
- V. Is exposed to possible destructive distensive pressure from above, below, or both.

It is also established that the valve is frequently unable to withstand the strains to which it is subject, since various able roentgenologists have reported it incompetent in the proportion of one case in five.

Also, incompetence, when found, may not be dismissed as harmless and unimportant, or merely as a symptom pointing to something else. It has, on the contrary, been proven by Kellogg and others to be a direct cause of disagreeable symptoms from which the patient may properly expect to obtain at least some measure of relief.

What is the real frequency of incompetence? When found, is it congenital or acquired, and in what proportion? How often is medical treatment adequate? May it ever restore the valve to actual competence? These and other questions await solution; the valve has been as yet too infrequently an object of careful study.

A growing personal experience, however, would seem to justify the following assertions:

I. In the mild or ambulant group of chronic intestinal cases, the frequency of incompetence may be distinctly in excess even of the accepted ratio of one to five.

II. When present, incompetence should be treated as an undesirable pathologic entity; an entity however usually responsive to intelligent treatment.

III. Under adequate medical treatment the patient may be assured at least some degree of improvement, with corresponding alleviation of symptoms; surgery is only secondarily indicated.

IV. Medical treatment may even restore the valve to complete competence.

V. The progress and results of treatment are under absolute control, through the agency of the bismuth-roentgen meal and enema.

Case has said, "once incompetent always incompetent." But this cannot always hold true, as witness the following case report, in which it is especially desired to focus attention upon the roentgen notes by Dr. Dodd. For though the possibility has been inferred, a moderate search of the literature has revealed no such actual proof of the restoration to complete competence by non-surgical means, of a valve previously demonstrated incompetent.

Mr. S., age 64, height 5 ft. 11 inches, weight 205 pounds. Formerly a powerful athlete, Mr. S. had become soft and heavy without losing his appetite. Since childhood he had suffered from nervous headaches induced by excitement, as had some members of his family. When first seen on Oct. 5, 1915, he complained of rapid exhaustion of nervous energy, fitful sleeping after 3 A.M., cold hands and feet, subnormal temperature and constipation; more particularly of spells of abdominal discomfort associ-

ated with right iliac pain and excessive gas in the intestines; the spells always were aggravated by being tired, and lasted a month or so at a time.

Examination showed fatigue posture, eyes and skin yellowish, lower lids puffy, fat pads above the clavicles, large relaxed abdomen, and moderate chronic edema of the ankles; thorax full, lungs negative; heart large but compensated; abdomen full of wind, tympanitic throughout, pain and coarse crepitation on pressure over the right iliac fossa; knee-jerks very lively; all muscular movements very active; mentally introspective, easily depressed; pulse 70; blood pressure 165/120; urine normal except for the s. p. t. of albumen long known to be due to a mild chronic interstitial nephritis. Roentgen examination, Oct. 7, by Dr. Dodd, showed a large transverse heart and dilated arch of the aorta; also, ileal cecal and colonic stasis, and an incompetent ileo-cecal valve.

Under treatment the posture became erect; the skin and eyes cleared; the edema of the ankles disappeared; the weight dropped 22 pounds, to 183; the puffiness under the eyes markedly decreased, as also the fat pads over the clavicles; the abdomen became inches smaller, and its muscles firm; the bowels became regular, and abdominal discomfort from gas or pain practically ceased. On April 1, Dr. Dodd reported that a "bismuth enema did not reveal any evidence of an incompetent ileo-cecal valve." The cardio-renal condition remained about the same, but bowel disturbances had by then been practically eliminated. Mr. S. had become fixed in his new habits of health and diet. Throughout the past summer he has remained "remarkably free from discomfort." At the end of September he had a slight recurrence of his intestinal trouble, following upon several days of physical over-exertion. He had, however, learned how to care for himself, and speedily recovered.

There are many cases of the type described. They may, without great effort, be restored to a condition of mind and body which will give promise of an enjoyable and useful old age, rather than a too early demise.

Diagnosis of ileo-cecal incompetence is absolute by means of roentgenoscopy. In the present stage of development of the science it is as inexcusable to omit roentgen study of an intestinal case which does not readily react to treatment, as it is to neglect a Wassermann test in an appropriate case. Given a case with a chronic intestinal history, with local pain, coarse crepitation on pressure over the right iliac fossa, excessive gas formation not easily relieved, constipation, stasis, and evidences of toxic absorption; a presumption of valvular incompetence is created which should be subjected to proof. Under toxic symptoms come migraine and recurrent headaches, fatigue worse in the morning than at night, inability to rest, and early morning loss of sleep, cold extremities and subnormal temperature, constant fatigue posture, and a yellowish discoloration of the eyes and skin; the skin may show anything from a faint dirty yellow color to the bronzing of Addison's disease, and is especially noticeable about the eye socket where first the lower lid and then the upper lid acquires progressive coloration.

It is obvious that, for example, cold extremities and subnormal temperature may have other explanations, and in fact in the above case they were at least partly due to the mild hypothyroidism so common in stout elderly persons. But should all or most of the symptoms mentioned be present, the burden of proof that the valve is not incompetent, rests at least with the practitioner who refuses to his patient the benefit of a skilled roentgen examination.

Treatment will be considered later. Evidence has, however, been presented which suggests that treatment directed toward the relief of incompetence of the ileo-cecal valve may be worth while, since it may result in distinct improvement in the health of the patient.

### Book Reviews.

*Pulmonary Tuberculosis.* By MAURICE FISHBERG, M.D. Philadelphia and New York: Lea and Febiger. 1916.

This volume, consisting of over 600 pages and containing many excellent diagrams, illustrations and plates, is the latest addition to the literature, already voluminous on the general subject of tuberculosis. In view of the recent comprehensive works on this subject, it is manifest that little new can be added, so that what we already know can merely be presented in new and attractive style. Dr. Fishberg states that an experience of 18 years is convincing that careful home treatment is productive of practically the same immediate and ultimate results as institutional treatment, and is less costly to the patient and to the community. The reviewer is of the opinion that the vast majority of workers in the field of tuberculosis would not agree with this statement, and that this point of view cannot possibly be maintained or proved. Dr. Fishberg very wisely calls attention to the fact, becoming of more importance every day, that not everyone infected with tuberculosis is destined to become sick, and that a sharp distinction must be made between tuberculous infection and tuberculous disease. Likewise, speaking of the value of the X-ray in diagnosis, he calls attention to a similar point that the X-ray does not necessarily give conclusive proof that the patient is sick, and in need of prolonged and costly treatment. In his chapter on percussion, he wisely states that dullness alone, without any general symptoms of phthisis, proves nothing, just as in radiography, a shadow over an apex does not prove an active tuberculous lesion. In his chapter on auscultation, the reviewer is glad to see proper value given to the whispered voice. The value of the X-ray, which many enthusiasts have considered to be very great even in the incipient stage of phthisis, Dr.

Fishberg points out to amount to very little except in the rarest of instances. In speaking of medicinal treatment, he devotes several pages to the use of creosote, ichthyol and arsenic. The reviewer is of the opinion that reference to these drugs in the treatment of pulmonary tuberculosis, except that they are of no value, whatsoever, and usually do harm, might well be omitted. With the exceptions mentioned, especially as to the value of home treatment versus treatment in a sanatorium, with which many will disagree, the book can be highly recommended. It contains an immense amount of information, representing much work clearly and attractively presented.

*Medical Hints for the Use of Medical Officers Temporarily Employed with Troops.* By J. EDWARD SQUIRE, M.D. London: Oxford University Press. 1915.

This is one of a series of war primers published by the Oxford University Press. It attempts to cover the medical problems which confront the physician of civil life who enters the army. Within the scope of 120 odd pages it is obviously impossible for the author to attempt more than a cursory survey of the medical conditions met with in active army life. The book is occasionally marred by the use of such an obsolete expression as "pleurisy is commonly caused by chill." Preventive and sanitary measures receive rather scant consideration. The book does reflect, however, the large personal experience of the author in the care of sick soldiers.

*The Basis of Symptoms, the Principles of Clinical Pathology.* By DR. RUDOLPH KREHL. Authorized translation from the Seventh German Edition. By ARTHUR FREDERIC BEIFELD. Third American edition. Philadelphia: J. B. Lippincott. 1916.

Two earlier editions of Professor Krehl's "Pathologische Physiologie" were translated by Dr. Hewlett, and are well known under the title of "Clinical Pathology."

It is somewhat hard to understand why the translator in changing the title did not adopt a literal translation, since pathological physiology represents the subject-matter of the book. This work has now reached seven editions in German and the translator has continued Dr. Hewlett's great service in making this edition available for American readers. It is not necessary to dilate with enthusiasm upon this admirable, stimulating book, even on the excuse of the appearance of a new edition. The same general outline of the previous editions is followed and the treatment is essentially the same. The translator has done his work well and occasionally helps the text by discriminating parenthetical remarks.



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### NEW ENGLAND SURGICAL SOCIETY.

THE first annual and inaugural meeting of the New England Surgical Society was held in Boston on October 5, 6, and 7, under the presidency of Dr. Samuel J. Mixer of this city. The sessions were held at the Harvard Medical School, at the various Boston hospitals, at the Harvard Club and at the Copley-Plaza Hotel.

At the initial meeting at the Harvard Medical School on the morning of October 5, there were papers by Dr. John W. Churchman of New Haven, Conn., on "A Group of Injuries in Modern Warfare," and by Dr. Edward P. Richardson of Boston on "Jejunal Ulcer Following Posterior Gastro-enterostomy." There was a symposium on the large intestine, with papers by Dr. Homer Gage and Dr. Ernest L. Hunt of Worcester, Dr. Peer P. Johnson of Beverly, Dr. John W. Keefe of Providence and Dr. Frank H. Lahey of Boston. There were demonstrations and operative clinics at the

Children's Hospital, Free Hospital for Women, Massachusetts General Hospital, Carney Hospital, Peter Bent Brigham Hospital, and the Boston City Hospital. On Friday afternoon there was a second literary session at the Harvard Medical School and in the evening a dinner at the Harvard Club, at which the presidential address was delivered. The complete proceedings of the New England Surgical Society will be published in later issues of the JOURNAL, which is its official organ.

The New England Surgical Society was organized early in 1916, with a membership of 75 representative surgeons from the six New England states. It comprises a group from Portland, Maine, representing the Bowdoin Medical School; a group from Burlington, Vt., representing the University of Vermont; a group representing the Dartmouth Medical School; a group from Providence, R. I.; a group from the Yale Medical School and other surgical centers in Connecticut; and a large group from Massachusetts. During its initial year the officers of the Society have been as follows: President, Dr. Samuel J. Mixer of Boston; vice-president, Dr. John B. Wheeler of Burlington, Vt.; secretary and treasurer, Dr. Philemon E. Truesdale of Fall River, Mass. The executive committee has consisted of Dr. John W. Keefe of Providence, R. I.; Dr. Joseph M. Flint of New Haven, Conn.; Dr. Lyman Allen of Burlington, Vt.; Dr. Herbert L. Smith, Nashua, N. H.; and Dr. William L. Cousins of Portland, Me.

The Society will meet but once a year, in the leading New England cities successively, and at each annual meeting will make a special effort to obtain from its members their most recent and best productions. The arrangements for this first meeting in Boston were under the able management of a committee consisting of Dr. William P. Graves, Dr. Charles A. Porter, Dr. Fred B. Lund, Dr. John T. Bottomley, Dr. David Cheever, and Dr. Charles G. Mixer. Upon the occasion of this meeting, which was well attended and met with a notable degree of success, the JOURNAL takes pleasure in extending its cordial good wishes to the New England Surgical Society, whose activities should lead not only to the production of valuable scientific material in surgery, but to the closer coöperation and mutual acquaintance of practitioners in surgery in the large hospital centers throughout New England.

## ELIMINATION OF THE RAT.

In the issue of the JOURNAL for September 21, 1916 (Vol. clxxv, p. 397), we published, with editorial comment in another column, an important paper by Dr. Mark W. Richardson of Boston, formerly secretary of the Massachusetts State Board of Health, advancing the theory of the transmission of poliomyelitis through the agency of the rat flea. Immediately following the publication of this article, a movement was initiated by the Women's Municipal League of Boston for the extensive destruction of rats in this city. This movement was originated by Mrs. Robert S. Bradley, and will be carried out under the management of Mrs. Albert T. Leath-erbee. Circulars and posters have already been issued, and the following statement of its purposes has been made by the League:

"Aside from its menace as a pathological agency, the economic loss due to rats is enormous. This creature is omnivorous and otherwise destructive, and there is no known commodity of manufacture and commerce that it does not injure. Government experts have officially proclaimed that rats consume property to the extent of \$1.82 each per year, and that their number equals the human population. The rat is a menace to buildings in its liability to gnaw out supports and foundations, unless thoroughly rat-proofed, and in its ability to cause fires through gnawing of matches and the insulation from electric wires—which last item is computed to cost the underwriters about \$15,000,000 yearly. The Women's Municipal League intends to go about this matter in a perfectly practical manner along lines already proved effective. It will form rat clubs, which will work in co-operation through the entire city, which clubs will be instructed by competent rat catchers in the most desirable and effective methods of rat extermination. In this work they have the hearty support of the Mayor and the City Administration, and the endorsement and official coöperation of the City Board of Health. To prosecute properly this undertaking, it will be necessary to raise funds from public subscription, but as rats are destroying nearly one and one-half million dollars of property yearly in the city, the League feels that the people should be glad to subscribe a few thousands on this work, realizing that every rat killed means the extinction of its progeny, which are to be figured in the hundreds yearly. While they hope that it may be possible with time, the enactment of proper ordinances and the general education of the people as to the true habits of rats, to make the city ratless, they know that much can be done now in exterminating large numbers. If San Francisco could in a few months destroy over 500,000, surely Boston can

do as well. They hope for the generous support of the citizens."

Whether or not Dr. Richardson's theory is proved correct, that poliomyelitis is transmitted through the agency of the rat flea, it is well recognized by physicians that the rat, from many aspects, is an important menace to the health welfare of the community. The Women's Municipal League, therefore, deserves and will receive the cordial commendation and support of physicians in its efforts towards the elimination of the rat for the benefit of the public.

## COLORED THINKING.

We all have ways peculiar to ourselves of visualizing abstract conceptions. Sometimes these are due to aids to memory which we used in learning such educational elementaries as the alphabet, the multiplication table, the months of the year, etc., or they may be due to certain fortuitous associations. Thus the particular color a letter was painted in the picture book studied by a child may determine his chromatic conception of that letter through life. Or the object used to illustrate each letter may be associated in the same way: A, with apple; B, with banana; C, with cherry and so on. We know a physician who thinks of the numbers one to twenty as a sort of ladder; after twenty there is an abrupt descent and the numbers climb again to thirty, which is a little higher than twenty; this process is repeated with each set of ten and when 100 is reached this is thought of as several small hills close together. A thousand is represented by a large orchard and a million is just something very bright, but has no more definite appearance.

Probably the commonest way of representing abstract ideas is by color—indeed, it is doubtful whether any of us is entirely without a little of this chromatic thinking. In some individuals it is so pronounced that each numeral has its distinctive color. Sounds, tastes, and emotional affects all have their chromatic representation to such persons. In a recent paper Professor Blanchard<sup>1</sup> proposes for this psychic phenomenon the term "chromatic encephalopathy." We have been accustomed to refer to it merely as "thinking in color." It is as yet a question whether or not there are any other psychic peculiarities associated with it. Dr. Fraser Harris,<sup>2</sup> writing in 1908, states that these pec-

pie, whom he calls, after Galton<sup>3</sup> "psychochromaesthetes" or merely "seers," are "as a rule rather above than below the intellectual average." According to Havelock Ellis,<sup>4</sup> women have this faculty more frequently than men.

The chief characteristics of chromatic conception were laid down by Sir Francis Galton in 1883, and have been in the main confirmed by other observers. They are as follows: First, these associations between concepts and colors have been formed at a very early age. Second, these concepts are distinctly individual; thus the letter "S" may be white to one person, green to another, blue to another, and so on. Only by coincidence, as it were, do two persons have the same psychogram. Third, these conceptions are definite and change very little in the course of time. Such changes as occur are not very radical either, that is, white may change to silver and silver to gray, but never white to black. Fourth, this mental faculty is hereditary, as much so as Huntington's chorea.

It is impossible to tell the exact personnel of the distinguished company in which the psychochromaesthete finds himself, for it seems difficult to get persons to admit this form of thinking, probably on account of an impression that it is a childish sort of thing. However, we know that the following persons may be listed as being "seers": Sir Francis Galton, the scientist; Ellen Thornycroft Fowler, the author; Dr. Head, the neurologist, the Rev. S. Henslow, the botanist, and Baudelaire, the French poet. These are undoubtedly only a few of the eminent persons thus endowed, but as time goes on and more is learned about this faculty, it is possible that some of its implications will be so creditable that we shall find persons boasting of it instead of concealing it, as is often the case now.

## REFERENCES.

<sup>1</sup> Bulletin de l'Académie de Médecine, No. 21. Séance du 25 Mai, 1916.

<sup>2</sup> Colored Thinking, by D. Fraser Harris, M.D. Journal of Abnormal Psychology, June-July, 1908.

<sup>3</sup> Enquiries into Human Faculty, by Sir Francis Galton.

<sup>4</sup> Man and Woman, by Havelock Ellis, rev. ed. p. 159.

case of Australia, as evidenced by the "Health Act Amendment Act," which has recently become a law by receiving the Royal approval. It is directed against venereal disease, and is extremely drastic in its provisions. It provides that no one except a doctor shall attend such cases, penalty \$250; a person knowing or suspecting that he has such a disease shall put himself under medical treatment, penalty \$100; physicians must report such cases, penalty \$25; they must also report failure of the patient to attend for six weeks, give written warning to the patient of the danger of the disease, with special cautions against marrying, penalty of non-observance of each of these rules, \$25; parents of children under sixteen must answer for them, penalty, \$50. Furthermore, should the Commissioners of Public Health receive the information that any one is suffering from venereal disease he must require that person to furnish a certificate from a physician that it is, or is not, true; if for any reason he feels dissatisfied with this certificate he may require a health officer or two private doctors to examine the suspect. The health commissioner is also authorized to arrest and detain any person suffering from venereal disease for two weeks if he thinks that there is danger of infection, and any person knowingly infecting another is fined \$250.

Provision is made that all proceedings under this act shall be secret, and any newspaper publishing an account of such proceedings shall be fined \$500 for the first offence, \$2500 for the second. The law, furthermore, forbids advertising of medicine, instruments, or appliances for venereal disease, impotence, female irregularities, etc. No printed matter in regard to such devices is allowed to be distributed in any way. Any breach of confidence by an administrator of the act may be punished by a fine of \$500.

To aid in educating the public in this matter, the government has issued a pamphlet dealing with sexual matters. This is written in a plain, non-technical style, the important passages are printed in red ink, and the common names of organs and diseases are used, besides their scientific ones, in order that there may be no misunderstandings. The ways in which these diseases may be contracted, the danger of infecting others, the horrible ultimate effects possible, and the precautions to be taken are all described clearly and forcefully. The importance of skilled treatment is emphasized, but no

## THE REGULATION OF VENEREAL DISEASE IN AUSTRALIA.

THE Western Hemisphere seems determined to be more progressive than the Eastern, even if a colony has to display its progressiveness at the expense of its mother country. Such is the

hint of the treatment is given—quite properly. Some of the most prevalent fallacies about sexual matters are mentioned and dispelled. This book must be handed by every physician to his venereal patients and it is also distributed in other ways, notably to the soldiers in camp.

This campaign against venereal diseases has the merit of enthusiasm, justice and vigor. The act in question is, perhaps, a little too rigorous in parts and in other parts leaves some loophole for evasion, but time will round off the rough edges. We hope that the Australian people will be ready for this legislation; otherwise, of course, it will soon become a dead-letter. The spirit in which it was conceived, however, is admirable, and coming generations will reap the benefit.

#### A NEW FORM OF POST-GRADUATE TEACHING.

THE Springfield Academy of Medicine, under the presidency of Dr. H. W. Van Allen, has organized a new form of post graduate teaching which bids fair to be most successful, and seems to possess many advantages. The Academy announces the following courses arranged with the cooperation of the Harvard Graduate School of Medicine, to be given in Springfield by teachers from the Harvard Medical School.

Eye, Ear, Nose and Throat. Philip Hammond, E. A. Crockett, Harris P. Mosher, Alexander Quackenboss. Tuesdays from Nov. 14 to Dec. 19.

Dietetics and Gastroenterology. Franklin W. White. Sundays from Nov. 17 to Dec. 22.

Clinical Laboratory Diagnosis. Lesley H. Spooner. Tuesdays from Jan. 2, to Feb. 6.

Obstetrics and Gynecology. Franklin S. Newell, William P. Graves. Fridays from Jan. 5, to Feb. 9.

Dental Infections and Arthritides. Geo. H. Wright, E. G. Brackett. Tuesdays from Feb. 13, to Mar. 20.

Cardio Vascular-Renal & Pulmonary Diseases. Frederick T. Lord. Fridays from Feb. 19 to Mar. 23.

There are about six exercises in each course, beginning at 4:15 in the afternoon and lasting two hours. The number of physicians taking the different courses is to be limited by each instructor, and the courses are open to all members of the academy upon payment of a registration fee of five dollars. For each set of exer-

cises there is to be a monitor, selected from the local physicians, whose duty it is to see that all the material required by the instructor is made ready for him. Already in Springfield the success of the plan is assured and the courses are nearly all full. Provided the equipment and the variety of illustrative cases can be made comparable to those in the university centre, there can be no question of the advantages which such a course possesses for the busy physician practicing at a distance from the centre. For the instructor it means only the extra time of the train journeys, and limits this inconvenience to one person instead of inflicting it upon many.

It is obvious that certain courses can not well be given away from the technical laboratories of the medical schools or the wards of great hospitals, but the JOURNAL believes that this plan offers very great opportunity for much extension of knowledge and for an interchange of ideas, valuable alike to the university and to those whose practice is at a distance from the usual teaching centres. If the plan is continued, and is extended to other communities in New England, it may go far toward welding together medically this important northeastern corner of the country. It will bring the men doing work under the somewhat self-centering influence of large hospitals and special opportunities into contact with the broader problems of medical practice away from the university, and will increase their respect for their fellow workers. It will also prove to men outside that what may seem to them the self-satisfaction of the university men is often only a self absorption which needs the reagent of contact to make evident the presence of a real desire for cooperation.

#### MEDICAL NOTES.

**POLIOMYELITIS EPIDEMICS.**—On Friday, October 13, the total number of cases of poliomyelitis in New York City reached the amount of 9187, with 2352 deaths. In Massachusetts the number of cases during the first fortnight of October reached a total of 331. The total number of cases in this Commonwealth since January first is 1347, of which 337, with 68 deaths, have been in Boston. There have been 23 cases, without fatality, at Worcester, Mass., and 85 cases in Providence, R. I.

**PREVALENCE OF DISEASE IN THE UNITED STATES.**—The weekly report of the United States Public Health Service for September 29 states that during the month of August, 1916,

there were in Mississippi, 33,579 cases of malaria, 658 of pellagra, and 1040 of typhoid fever. During the same period there were 419 cases of malaria in Louisiana and 940 cases of typhoid fever in Indiana.

**THE ORIGIN OF INTESTINAL ANASTOMOSIS.**—A correspondent in the issue of the *Lancet* for September 23, 1916, draws attention to the mediæval origin of intestinal anastomosis. He points out that Lanfranc, in his "Science of Chirurgie" (Capt. 7, Treatise 2), describes suture of the severed intestine over a pipe of elder. Lanfranc was the pupil of Saliceppi of Bologna, to whom, if not to Lanfranc, the origin of the idea may be due. This use of the elder pipe, dating back to 1250 A.D., may be regarded as the precursor of the Murphy button.

**HOSPITAL GIFT.**—It is announced that Mr. Herbert Kaufman, of Pittsburgh, Pa., has given, through Dr. H. B. Frauenthal, the sum of \$1,000,000 to the New York Hospital for Deformities and Joint Diseases, to be used for the erection of a new building and as an endowment fund.

#### EUROPEAN WAR NOTES.

**TUBERCULOSIS IN BELGIUM AND FRANCE.**—Dr. William Palmer Lucas, formerly instructor in pediatrics at the Harvard Medical School, later professor of pediatrics at the University of California, who had been engaged by the American Belgian Relief Commission to study health conditions in the conquered portion of that country, has recently made, under date of August 14, a report of his findings, which is, in part, as follows:

"It may be said at once that the increase in tuberculosis appears to me to be mainly a result of lowered vitality due to under-feeding, and that, if conditions were now to return to the normal, the unaffected adults would, upon liberal nourishment, within two or three months probably return to their former health conditions. This, of course, is not true of those who have become affected with tuberculosis, nor is it so true of the adolescent children, who are probably suffering more than any other group in this class.

"During the coming winter, with a diminution in the native supply of vegetables and fruit, which now, to a certain extent, these classes are able to procure, the ration will be considerably lower than it is at the present time, and unless something can be introduced, especially for the tuberculous, the whole tuberculosis situation will undoubtedly progress more rapidly than it has done in the past.

"Every tuberculosis sanatorium in Belgium is crowded, the waiting lists of all the sanatoria have increased, and the waiting cases are more acute than formerly.

"Not every aspect of the health conditions of the children in Belgium is so gloomy as these facts would indicate. Infant mortality has fallen since the beginning of the war and deserves special comment. It is generally evident that infant conditions are better than normal, this class having been the object of great solicitude since the beginning of the war.

"The solicitude of the whole relief organization over the question of health and nutrition has been insistent since its inception. The maintenance of these measures is an absolute and daily necessity to the population. The interruption for a single month of the work that is now being accomplished by the relief organization would unquestionably bring a physical debacle to the industrial and lower commercial classes."

In this conjunction may be noted the work already undertaken in behalf of tuberculous French soldiers, of whom it is reported by Mrs. Edith Wharton, that there are at least 100,000. In behalf of the French Tuberculous War Victims Committee, Mrs. Wharton has recently made the following report and appeal:

"It is urgently needful to provide further assistance without delay, and American initiative, by acting rapidly and efficiently, may not only render an immediate service, but set an example that will be followed in time by other organizations of the same kind.

"The work projected by the Tuberculous War Victims Committee is as follows:

"1. To establish as soon as possible at least three sanitary stations of about eighty beds each in different climates suited to different forms and stages of the disease.

"2. To open a hospital of about fifty beds in Paris, in which the patients may be kept under observation until it is decided to which station they should be sent.

"3. A separate station for women and children, or a separate colony for women and children at each station, will form a complementary part of the work. At the present moment no free hospital for tuberculous civilians is open in France, and all existing hospitals for civilian patients are overcrowded and understaffed. Large numbers of the women and children from the invaded provinces are in bad health owing to the shock and privations they have undergone, and incipient cases of tuberculosis are of alarming frequency in the poorer classes.

"4. The object of the committee will be, not only to restore the curable to health, but, if possible, to teach them a trade or occupation enabling them to earn their living in the country, or at least away from great cities. With this in view, a member of the committee has already placed at its disposal a chateau in Touraine, surrounded by a large park and vineyards, to be used as a kind of agricultural training school to which all suitable tuberculous subjects may be sent.



"5. It is the intention of the committee to keep each patient as long as his or her condition requires.

"6. The Tuberculous War Victims Committee will be administered by Americans, but the superintendence and management of the sanitary stations will be principally in the hands of French doctors, superintendents and nurses especially qualified for the care of the tuberculous.

"The Boston committee, which is coöperating with Mrs. Wharton, contains the following-named persons:

"Miss Sally Fairchild (chairman), Dr. Vincent Y. Bowditch, Mrs. Arthur Cabot, Miss F. G. Curtis, Mrs. Allan Forbes, Mrs. Richard W. Hale, Dr. Edwin A. Locke, Mrs. George Cabot Lodge, Mrs. Robert W. Lovett, Miss Ellen Mason, Miss Fanny P. Mason, Mrs. Roger B. Merriam, Mrs. Edward Pickman, Professor W. T. Sedgwick and Dr. F. C. Shattuck.

"Richard W. Hale, 16 Central Street, Boston, is treasurer of the committee, and funds are earnestly solicited for the work. All subscriptions will be duly acknowledged in the public press."

**WAR RELIEF FUNDS.**—On Oct. 14 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$157,510.74
French Wounded Fund .....	126,240.71
Serbian Fund .....	102,886.07
Syrian Fund .....	67,646.61
Surgical Dressings Fund ....	48,425.45
Polish Fund .....	45,779.83
Italian Fund .....	25,968.54
St. George's Fund .....	14,731.92
French Tuberculous Fund ...	3,001.00
Louvain Professors' Fund ....	605.00

#### MEXICAN NOTES.

**MORBIDITY AND MORTALITY OF TROOPS.**—Report from Washington on October 4 states that during the week ended September 30, the morbidity percentage among militia troops on the Mexican border was 2.25, with seven deaths, as against 2.38 and six deaths for the preceding week. The corresponding figures for regular troops during the same period were 3.42, with five deaths, as compared with 2.53 and seven deaths for the previous week.

#### BOSTON AND NEW ENGLAND.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Oct. 14, 1916, the number of deaths reported was 218, against 226 for the same period last year, with a rate of 14.95, against 15.21 last year. There were 34 deaths under one year of age, against 39 last year; and 65 deaths over 60 years of age, against 55 last year.

The number of cases of principal reportable diseases were: diphtheria, 33; scarlet fever, 18; measles, 8; whooping cough, 9; typhoid fever, 3; tuberculosis, 48.

Included in the above were the following cases of non-residents: diphtheria, 6; tuberculosis, 8; typhoid fever, 1; scarlet fever, 1; measles, 1.

Total deaths from these diseases were: diphtheria, 1; measles, 1; whooping cough, 1; tuberculosis, 20.

Included in the above were the following deaths of non-residents: tuberculosis, 4.

**BOSTON BABY HYGIENE ASSOCIATION.**—The Boston Baby Hygiene Association has recently issued statistics of its work for the past summer.

"During June, July, August and September, 3258 babies were cared for. These babies made 11,419 visits to medical conferences, an average conference attendance of forty, and received from the nurses 21,084 home visits. The registration showed an increase over the corresponding months last year of 8%. Conference attendance increased 24% and nurses' visits 26%, the increase in service being three times the increase in registration. As would be expected, although the number of babies cared for was greater than last year, fewer babies were referred to physicians and hospitals on account of illness. The Association at present has thirteen stations, seventeen medical conferences each week and seventeen full-time nurses."

Funds are urgently needed for the continuance of the work during the coming winter, and contributions for this purpose should be sent to the treasurer, F. Abbot Goodhue, Esq., 296 Boylston Street, Boston.

**OPENING OF NORWOOD HOSPITAL.**—The new Norwood (Mass.) Hospital was formally opened to the public for inspection on October 5. It will accommodate thirty patients and has a nursery and seven private rooms. The ground floor is devoted to the men's ward and to administrative offices; the second floor, to the women's ward, operating room and private rooms; and the third floor to the maternity department. The former building of the Hospital is to be moved and converted into a nurses' home.

**HOSPITAL BEQUESTS.**—The will of the late Mrs. Thomas Mack, recently filed in the Suffolk Court, contains a bequest of \$3000 to the New England Hospital for Women and Children.

The will of the late Ellen Williams contains a bequest of \$300 to the Holy Ghost Hospital.

The will of the late Henry F. Lynde, of Somerville, Mass., who died on September 24, contains bequests of \$3000 each to the American Red Cross, the Boston Dispensary, and the Massachusetts General Hospital.

The will of the late Margaret A. Simpson of Somerville, Mass., who died on September 9,



contains a bequest of \$15,000 to the Somerville Hospital, of which \$5000 is for a free bed and \$10,000 to constitute a trust fund, the income of which is to be used for the general purposes of the institution.

## Massachusetts Medical Society.

### STATED MEETING OF THE COUNCIL.

A STATED meeting of the Council was held in John Ware Hall, Boston Medical Library, Wednesday, October 4, 1916, at 12 o'clock, noon. The president, Dr. Samuel B. Woodward, was in the chair, and the following 93 councilors present:

BARNSTABLE,  
E. E. Hawes.  
C. W. Milliken.

BRISTOL NORTH,  
W. H. Allen.  
R. D. Dean.  
F. A. Hubbard.

BRISTOL SOUTH,  
E. F. Cuffy.  
W. A. Dolan.

ESSEX NORTH,  
J. J. Clarke.  
G. E. Kurth.  
E. H. Noyes.  
J. J. O'Sullivan.  
P. W. Snow.

ESSEX SOUTH,  
Emile Poirier.  
C. H. Bangs.  
R. E. Bicknell.  
N. P. Breed.  
J. F. Donaldson.  
P. P. Johnson.  
W. G. Phippen.

FRANKLIN,  
G. P. Twitchell.

HAMPDEN,  
E. P. Bagge, Jr.  
J. M. Birnie.  
T. S. Bacon.  
E. A. Knowlton.

HAMPSHIRE,  
J. S. Hitchcock.

MIDDLESEX EAST,  
C. J. Allen.  
G. N. P. Mead.

MIDDLESEX NORTH,  
J. V. Melgs.  
J. A. Gage.

MIDDLESEX SOUTH,  
M. H. Bailey.  
H. T. Baldwin.  
C. H. Cook.  
G. W. Gay.  
A. A. Jackson.

G. A. Miles.  
C. E. Mongan.  
J. F. O'Brien.  
W. A. Putnam.  
Godfrey Ryder.  
E. H. Stevens.  
F. W. Taylor.  
J. O. Tilton.  
Julio Tolman.  
G. W. W. Whiting.  
Alfred Worcester.

NORFOLK,  
T. F. Greene.  
E. H. Brigham.  
A. N. Broughton.  
P. W. Carr.  
C. R. Faunce.  
R. W. Hastings.  
G. W. Kean.  
Bradford Kent.  
Joseph Kittredge.  
W. A. Lane.  
T. J. Murphy.  
A. P. Perry.  
J. W. Pratt.  
Victor Safford.

NORFOLK SOUTH,  
C. S. Adams.  
J. C. Fraser.  
E. N. Mayberry.

PLYMOUTH,  
A. A. McKeen.  
Gilman Osgood.  
F. G. Wheatley.

SUFFOLK,  
E. S. Boland.  
E. M. Buckingham.  
W. L. Burrage.  
David Cheever.  
J. A. Cogan.  
G. A. Cralgin.  
E. G. Cutler.  
R. L. DeNormandie.  
Albert Ehrenfried.  
J. B. Hawes, 2d.  
H. T. Hutchins.  
J. L. Morse.  
Abner Post.  
Anna G. Richardson.

G. B. Shattuck.  
H. F. Vickery.  
D. H. Walker.  
C. F. Withington.

David Harrower.  
A. G. Hurd.  
F. H. Washburn.  
S. B. Woodward.  
C. D. Wheeler.

WORCESTER,  
G. O. Ward.  
F. H. Baker.  
Homer Gage.

WORCESTER NORTH,  
E. L. Fiske.  
A. P. Mason.

It was voted to dispense with the reading of the records of the last meeting.

The president said he appreciated the honor of election to the presidency, and bespoke the coöperation of the councilors in the furtherance especially of desirable legislation affecting the medical profession; that physicians were too apt to underestimate the influence that a united profession could exert at the State House,—a power that is recognized by the layman. He thought that the proposed consolidation of the Boards of Registration last year was defeated partly because of letters of protest that were sent to every senator and representative by a district medical society. The Committee on State and National Legislation has done notable work at the State House for many years. It has an auxiliary committee composed of one or more members from each senatorial district. It seems to be desirable that the members of this auxiliary committee should keep in touch with the family physicians of the legislators in order that they may be informed through the central committee of the facts regarding proposed legislation from a medical point of view. Prompt coöperation by the district secretaries with the Committee on State and National Legislation was requested by the president as chairman, under the by-laws, of this committee.

The committee, consisting of the president, secretary, treasurer and the chairmen of the standing committees on membership and finance and public health, elected at the annual meeting, June 8, 1915, had conferred with Henry Copley Greene, Carl Carstens and Miss Mary Beard, as authorized, and last June decided to engage Mr. E. A. Ingham, of the department of biology of the Massachusetts Institute of Technology and a graduate of the school of public health at Harvard Medical School, as an agent of the committee, and he is now at work under the direction of the Committee on Public Health. The funds subscribed by public-spirited individuals, amounting to over \$2000, are now in the hands of the treasurer, and they will be expended by the agent under the supervision of the above committee, for the following objects:

1. To stimulate the interest of the medical profession in Massachusetts in sanitation, hygiene and preventive medicine.
2. To urge cities and towns to employ full-time health officers.
3. To stimulate better work in medical inspection of schools, infant mortality, pre-natal

work, district nursing, anti-tuberculosis work, industrial hygiene, sanitary engineering, and the prevention of the common communicable diseases.

4. To investigate the health conditions of the State, with reference to the public health work.

During the summer the president had enjoyed the hospitality of five of the District Societies at their regular meetings, and had taken pleasure and profit in this close association. He hoped that the councilors were ready for co-operative work for the good of the Society, "one for all and all for one."

The president nominated and the Council appointed these delegates to the annual meeting of the Vermont State Medical Society, at St. Johnsbury, October 12-13, 1916: F. C. Downing, Lanesborough; N. P. Wood, Northfield.

In the same manner were appointed this committee to audit the treasurer's accounts: E. O. Otis, Boston; J. B. Ayer, Boston.

The following report of the Committee on Membership and Finance on membership and the report on finance were presented by Dr. Alfred Worcester, in the absence of the chairman. Both reports were accepted and their recommendations adopted by unanimous votes:

#### REPORT ON MEMBERSHIP.

THE COMMITTEE ON MEMBERSHIP AND FINANCE makes the following recommendations as to membership:

1. That the following named Fellows be allowed to retire, under the provisions of Chapter I, Section 5, of the by-laws:

John Gilbert, of Fall River.  
William Henry Grainger, of East Boston.  
William LeRoy Paddock, of Pittsfield.  
Frank Edward Porter, of Auburndale.

2. That the following named Fellows be allowed to resign, under the provisions of Chapter I, Section 7, of the by-laws:

Clarence Pennell Baxter, of Topsfield.  
Charles Frederick Morse, U. S. A. ("Somewhere in Mexico").

3. That the following named Fellows be deprived of the privileges of fellowship for non-payment of dues, under the provisions of Chapter I, Section 8, of the by-laws:

Anna Judkins Andrews, of Boston.  
Osmyn Baker, of unknown address.  
Willbur Howard Bliss, of Shrewsbury.  
William Frederick Boos, of Brookline.  
Nathaniel Perkins Breed, of Douglaston, Long Island, New York.  
Chester Perkins Brown, of Cambridge.  
Christopher James Carr, of Saxonville.  
George Alanson Crittenden, of Huntington.  
Richard Andrew Elliott, of Avon.  
Jay Percy Graham, of Springfield.  
Harry John Hazerty, of Worcester.  
William Frank Hayward, of East Brookfield.  
Clyde Clifford Johnston, of Springfield.  
Patrick Joseph Kingsley, of Dorchester.  
Antoinette Frederica Konikow-Bucholz, of Malden.  
Myron Lawrence Marr, of Dorchester.  
James Zuslofsky Naurison, of Springfield.  
Walter Eric Lothar Nietsch, of New Bedford.  
William Nelson Noyes, of Salem.  
John Wilson Parks, of East Boston.  
Laurence Earl Poole, of Gardner.

John Thomas Halliburton Powers, of Chicopee Falls.  
Julia Seton Sears, of unknown address.  
Thomas Aheru Shaughnessy, of Leominster.  
Eleanor Mary Slater, of Denton, Texas.  
Caroline Louise Thomas, of Malden.  
Thomas Henry Tracy, of unknown address.  
Frederick Myles Turnbull, of Allston.  
John William Voss, of Beverly.  
Harold Lowe Wallace, of Allston.  
Edward Silvanus Ward, of North Attleborough.  
Alva Harding Warren, of Everett.

4. That the following named Fellows be allowed to change their district membership, without change of legal residence, under the provisions of Chapter III, Section 3, of the by-laws:

Donald Vinton Baker, from Middlesex South to Suffolk.  
Eugene Gorham Hoitt, from Norfolk to Middlesex South.

For the Committee on Membership and Finance,  
CHARLES M. GREEN, *Chairman*.

#### REPORT ON FINANCE.

THE COMMITTEE ON MEMBERSHIP AND FINANCE makes the following recommendation as to Finance: That the affiliation with the BOSTON MEDICAL AND SURGICAL JOURNAL be continued, at an expense to the Society of three dollars (\$3.00), for each member in good standing.

For the Committee on Membership and Finance,  
CHARLES M. GREEN, *Chairman*.

The secretary read the reports of committees appointed at the last meeting to consider the petitions for reinstatement of J. D. Taylor, E. J. McCarthy and C. A. Oak, and the Council acted favorably on all of them. The petition of P. S. Marie was referred, by vote, to this committee: F. A. Hubbard, W. Y. Fox, A. F. Milot.

An invitation from the National Association for the Study and Prevention of Tuberculosis to send delegates to the third New England Tuberculosis Conference at New Haven, Conn., was read. It was moved and seconded that delegates be sent, and being put to a vote, was so voted, and these delegates were appointed on nomination by the president: A. K. Stone, Boston; A. C. Getchell, Worcester; G. F. Hart, Webster.

The president nominated and the Council appointed Homer Gage, Worcester, chairman, and J. B. Howland, Boston, secretary of the Section of Hospital Administration that was established by vote of the Council last June.

Dr. E. E. Hawes read a petition from the Barnstable District Medical Society asking that the annual dinner and reunion of the Society be held at 1 p.m., as in former years. He explained that the Fellows in his district, in order to attend the annual dinner, were forced to spend two nights in Boston; that they especially missed the social features of the meeting; that if Barnstable was the only district thus affected it would withdraw its petition; that it was his opinion that the dinner had not been so well attended since the change had been made, and he would like to have the matter discussed. Dr. Broughton, who was chairman of the Committee of Arrangements when the change was made in 1912, pointed out that the first evening dinner was attended by 940, as against a previous at-

tendance at midday dinners of about 1200. At the next dinner there were 1198 diners. When the plan of having every Fellow who attended the dinner pay \$1 was introduced in 1914, the attendance fell to about 700 and had remained there since. (1914, 700; 1915, 763; 1916, 704.) He thought that the previous one o'clock dinners had been undignified, and that many of the diners left immediately after the dinner, without waiting to hear the speakers, and that the character of the banquets had been improved by the change.

Dr. Withington regretted that the Fellows in the Barnstable and Berkshire districts were so far away that it was difficult for them to attend without spending another night, but he thought that there were so many living within forty miles who were able to attend an evening dinner, that that was the better time for a banquet. He suggested that the dinner might be given on the first day of the annual meeting, Tuesday, in the evening, rather than on Wednesday evening, and that the Committee of Arrangements might be able to arrange for it at that time. He made a motion that the time of the annual dinner be referred to the Committee of Arrangements, with a request to report to the Council at its February meeting, and it was so voted.

Dr. J. B. Blake made the following report for the delegation to the House of Delegates of the American Medical Association, last June:

REPORT OF DELEGATES FROM THE MASSACHUSETTS MEDICAL SOCIETY TO THE HOUSE OF DELEGATES, AMERICAN MEDICAL ASSOCIATION.

Massachusetts was represented by a complete delegation at the June meeting of the American Medical Association in Detroit.—J. B. Blake, F. B. Lund, G. Osgood, H. G. Stetson, L. F. Woodward.

An unusually large amount of work was accomplished by the House of Delegates with an exceptional unanimity of action; important changes were made in methods of procedure, and extremely interesting reports received, considered and adopted. A summary of the proceedings appeared in an editorial in the *American Medical Association Journal* of June 24th—which gives a good idea of the results.

"The Detroit session promises to be the most epoch-making of any since 1901 for two reasons: First, and more important, was the creation of the office of Chairman of the House of Delegates. This will relieve the President of the Association of the task of presiding over the House of Delegates. The President is usually elected on account of his scientific attainments, and not because of his ability to preside over a deliberative body. This new order of things will be a great relief to the President, and will give him time to attend to and participate in the functions which naturally appeal to the presiding officer of a great scientific body such as the Scientific Assembly has become. On the other hand, the House of Delegates will be presided over by a man selected because of his knowledge of the activities of the Association, of the procedure of the House of Delegates, and on account of his ability as a presiding officer. The House selected as its first Chairman, Dr. Hubert Work of Pueblo, who for many years was a member of the House and who is thoroughly conversant with its procedures. The second epoch-making change is that which provides that the opening meeting of the

Scientific Assembly—the General Meeting—shall be held on Tuesday evening, the scientific sections to convene on Wednesday morning instead of on Tuesday afternoon as heretofore. The main object of this change is to give the House of Delegates two days for its deliberations before the opening of the Scientific Assembly. It is unnecessary to dilate on the importance of this change so far as the House of Delegates is concerned; many men have hesitated to serve as members of the House because that work has prevented them from attending the sections. Under the new order of things the great probability is that the House of Delegates will complete its work on Tuesday, except for the election of officers, and business incidental to its closing meeting. The change will also be of decided advantage to the Scientific Assembly. Heretofore the Scientific Assembly commenced Tuesday morning, the first half day being taken up with the opening general meeting. Hereafter the opening exercises will take place on Tuesday evening, and the scientific sections will begin their programs on Wednesday, continuing through Thursday and Friday, meeting both morning and afternoon."

Among the other matters that came before the House was the consideration of the National Board of Medical Examiners. Dr. Rodman, the former President of the American Medical Association, was very active in originating and working for the establishment of this Board. There are great possibilities which may be expected from the activities of this Board in the matter of standardizing the licensing of physicians in the different states throughout the country, and it is, therefore, of vital general interest. The Board has sought the endorsement of the great national societies; after a very careful and rigorous investigation the House of Delegates gave its cordial endorsement to the National Board of Medical Examiners. A Massachusetts physician is a member of this Board.

The Massachusetts delegates were faithful in attendance and willing in the work of the meetings. The entire New England delegation agreed to nominate, for the Board of Trustees, Dr. Everett James McKnight, of Hartford, Connecticut, to take the place of Dr. Lutz, of St. Louis, who had died—and Dr. McKnight was elected. Massachusetts now is properly represented in all the important constituent bodies and committees of the American Medical Association.

Dr. L. M. Palmer made an oral report on his attendance as a delegate at the 150th anniversary of the New Jersey Medical Society, June 20, 1916, at Asbury Park, saying that he was most cordially received and entertained, and that kindly messages were sent to the Massachusetts Medical Society. He thought well of the custom of that society, namely, in taking the wives, mothers and sweethearts of the members to their anniversaries, and wished that the Massachusetts Medical Society could follow in their lead.

The privileges of the floor were voted to Dr. R. B. Greenough, who presented a resolution commending Senator Weeks and Congressman Olney for their services in securing the passage of the Army Reorganization bill, with an amendment whereby, for the first time in the history of the country, the Army and National Guard are supplied with a sufficient quota of medical officers for the prevention of disease and the proper treatment of illness and wounds. After discussion by Dr. Dolan, Dr. Wheatley

and Dr. Stevens, the resolution was laid on the table.

Dr. F. J. Cotton presented the following report for the Committee on Industrial Health Insurance:

Your committee was entrusted with the care of medical interests in the face of impending legislation to provide workmen's sickness insurance as a compulsory state insurance measure. We say "impending," for though it seems rather unlikely that such a measure will be passed at the next session of the Legislature, yet it seems to be coming pretty certainly before very long. It seems to be so imminent that we should be ready for it. What we did first was to talk over the general medical question, and then to take up the work done by the committee of the American Medical Association presented last spring. This report, published in the *JOURNAL* of the Association June 17, 1916, is probably well known to many of you. After very careful consideration in detail, your committee found only minor points in which we differed or wished to add to this report. Our comments and changes are appended. For consideration of the broad problem we have held to the so-called Doten bill as the type of legislation likely to be considered, and as it will come up automatically this year in the Legislature. This bill provides for no share to be taken by the insurance companies, and puts control in the hands of local mutual companies under state control. This plan lends itself to proper medical organization. It is important that medical affairs should be so arranged that choice of physician, at least within the limits of a very wide panel, be conserved. Central supervision and authoritative inspection are, of course, essential. All these things are considered in the reports above mentioned and need not be gone into here. We have talked over the situation with certain members of the recess committee of the Legislature, and we appeared, all three of us, together with Dr. A. N. Broughton and Dr. J. J. Hurley, at the only public hearing given by that committee and took part in the discussion. We have been informed by Mr. Farnsworth, the chairman, and by Mr. Catheron, another member of the committee, that they will let us know when the time comes (if it does come) for drafting any projected measure, or if there is any other way in which we can be of use. The representative of the State Department of Health on the recess committee, appointed by the Governor, is Dr. W. W. Walcott, of Natick, and we herewith acknowledge and thank him for his very intelligent cooperation with your committee. His presence on the recess committee is very fortunate, and with him there we can keep more closely in touch. We submit this as a report of progress.

F. J. COTTON,  
F. W. ANTHONY,  
W. H. MERRILL.

Dr. G. W. Gay showed to the Council the first book of the records of this Society, beginning with November 1, 1781, and stated that this book and three others, one of the Society records and two of the Council records, the four covering a period of forty-five years, and the small "Charter Book" were being typewritten through the generosity of the president. The official printed records of the Society and of the Council began in the year 1826. Previous to that date, the old books kept in the Society's safe in the vault were the only record of the early history of the Society, and should they be destroyed there would be nothing to show what had taken place in those early days. He hoped that when the typewriting had been completed some friend would come forward with the means for having them printed in a fashion similar to the existing records.

Dr. Gay read the following report on malpractice defense:

#### ANNUAL REPORT ON MALPRACTICE DEFENSE.

The number of cases of threatened suit for alleged malpractice presented to the secretary during the year ending October 1, 1916, was 28. Of this number, 12 were placed in the hands of counsel, 6 applications are in the files, thereby putting them in shape for further action, if necessary, and in 10 cases blanks have been sent and questions have been answered.

Of the 6 active cases referred to in the last report of our legal counsel, as of June 1, 1915, three are disposed of and three are alive, but not active. It may be doubted if they are ever revived.

Thirteen cases have come up this year, of which five have been disposed of. All verdicts thus far have been in favor of the defendant. On finding that the Society defends the suits of its members, many cases have been dropped and others are moribund with little prospect of a revival. The fact that the Society pays no damages, no verdicts, and will pay nothing towards settlement, discourages the shysters and lessens litigation. This is the result of experience in most, if not all the state societies. No hush money is paid to keep a case out of court. It is fight or retire.

The Medical Society of the State of New York has had a medical defense act in force for seventeen years. In over 200 suits no final verdict has, as yet, been returned for the plaintiff. No physician has been called upon to pay damages in any case defended by that Society's attorney. While our cases seem to be increasing, they seem to be decreasing in New York. In 1913 they had 57 cases, in 1914, 55 cases and in 1915, 44 cases. In that state, and doubtless to some extent here, suits are threatened to avoid the payment of the doctor's bill.

The alleged grounds for complaint in our cases are varied and interesting. As might be expected, fractures head the list. Of 19 cases at present, or recently in the hands of our counsel, seven, or more than one third, are of that sort. Four cases had to do with confinements. One suit is pending in which the physician is accused of negligence in permitting exposure to a contagious disease. The diagnosis of syphilis was the ground of another suit, but as the diagnosis was made by our leading experts, there was no difficulty in obtaining a verdict for the defendant.

**Expenses.** The amount paid out by this Society for the defense of its members from January 24 to July 5, 1916 is \$699.02, or an average of about 19 cents

apiece, as against 11 to 12 cents previous to this year. There are various reasons for this large increase, among which mention may be made of the following: The existence of the act is becoming more generally known among our Fellows and they are recognizing the wisdom of availing themselves of its advantages. It has been suggested that perhaps the increase in the number of suits brought, or threatened, is due to the Workmen's Compensation Act. This act has diminished litigation to a certain extent and, as a consequence, some members of the legal profession have encouraged suits against the medical profession more eagerly than formerly.

There can be no doubt that the trend of the times encourages all sorts of tricks to extort money from any defendant, who may chance to have more than the plaintiff. The rich are considered legitimate prey by a large class of people. Get something for nothing. What easier way is there than to threaten litigation with the hope of a settlement, the payment of hush money, or the evasion of a bill?

The object of this medical defense activity is to discourage fake suits and to protect our members from the expense and the annoyance of that sort of imposition. That it is a sane and sensible object would seem to be proven by the fact that about twenty-five state medical societies have adopted the practice and thus far none have repealed the act. This Society has entered upon its ninth year of defending its members in litigation, active or threatened, and time and experience serve only to demonstrate its value.

Dr. A. N. Broughton reported extemporaneously for the Committee on the Workmen's Compensation Act, saying that, on account of pressing professional calls, he had been able to devote little time to the duties of the office of chairman of the committee, an office he had not sought. He suggested that the committee be enlarged, and said that he was not anxious to remain as chairman, suggesting further that the city editors of the newspapers should be approached so that the profession might have a proper representation, and that a trained legislative aid be secured in order to coordinate the needs of the medical profession and to follow this sort of legislation. The need of immediate action by the Council was emphasized by Dr. Cotton and Dr. Dolan, the latter moving that the Central Committee appointed by the "First Legislative Convention of Massachusetts Physicians," held at Worcester, September 20, 1916, be added to the Committee on the Workmen's Compensation Act. (For Central Committee see BOSTON MEDICAL AND SURGICAL JOURNAL, October 5, 1916, p. 513.) The motion was amended to read that those members of the Central Committee who are Fellows of the Massachusetts Medical Society be added to the committee, and that the remaining two members be invited to join with the committee. As amended, the motion was put and passed. The question of providing funds for this committee was discussed by these councilors: Worcester, Clarke, Ward, Kaan, Dolan, Buckingham, Twitchell. Finally, after several plans had been discussed, the following vote was passed:

*Voted*, That the committees on the Workmen's Compensation Act and on Industrial Health Insurance be allowed to expend such sums as they deem necessary, subject to the

approval of the president and the Committee on Membership and Finance.

Dr. G. P. Twitchell presented and explained to the Council proposed amendments to Chapter V of the by-laws, appearing as a committee voted by the Board of Supervisors at a special meeting, held earlier in the day. The proposed amendments suggested by the Supervisors follow:

Page 17, Section 1 (*Board of Supervisors*), line 7, to follow the word "board," this sentence: He shall call special meetings at the request of five supervisors.

Same page, same section, third paragraph (*Diplomas of colleges not on list*), add at end of paragraph, deleting the period, the following: by the district secretary before an applicant is permitted to take an examination.

Same page, same section, last paragraph (*Examinations; when held*), second line, delete "at 2.00 p.m."; also next line, change the word "second" to "first" in the two places where it occurs.

Page 18, Section 2 (*How applications are made*), first line, substitute the word "fellowship" for the word "examination."

Same line, after the word "apply," insert the following: on blanks furnished for the purpose. . .

Same section, end of second line, delete the semicolon and add the following: at least one week before the date of a given examination.

Same page, Section 3 (*Duties of district secretaries*), second line, to follow the word "censors," add the following: shall furnish applicants with blanks adopted by the board of supervisors; they. . .

Adjourned at 2.19 p.m.

WALTER L. BURRAGE,  
Secretary.

#### APPENDIX TO REPORT ON HEALTH INSURANCE.

CHANGES IN, AND COMMENTS ON THE REPORT OF THE AMERICAN MEDICAL ASSOCIATION COMMITTEE TO THE JUDICIAL COUNCIL OF THE ASSOCIATION ON MARCH 15, 1916, BY THE COMMITTEE OF THE MASSACHUSETTS MEDICAL SOCIETY.

Section 10, p. 336 of the bulletin.

All of your committee favor the "limited panel" plan, but feel that, in the beginning, the panel must include all applicants who are legally qualified to practice.

Later weeding out of undesirables should be carried out by the central state body of control—such weeding out to be based on the record of service obviously incompetent, dishonest, or unduly commercial.

Section 11, same page.

We feel that such officers should be appointed by the central committee; not by the local carrier—to avoid undue local pressure—and that the duties of these officers should be defined very carefully. There is a risk of trouble in Section 11.

We think the "visitation" scheme preferable,—per visit, not per head or per patient,—a visitation fee, based on the average minimum rate for the locality, to be the best basis of compensation.



Obviously, this scheme will necessitate strong central censorship to avoid padding of bills by unnecessary visits on the part of our few medical undesirables. We feel, however, that this item can be handled;—the lowering of standard inevitable to the "capitation" plan—the plan that has led to the slipshod "lodge" practice we all know,—we feel that this result of a mistaken system cannot be controlled or remedied, and that such a scheme is likely to nullify much of the benefit of the contemplated plan, both as regards patient and physician.

We think there must be a corps of medical referees to adjudicate disputes between injured and carrier as to ability of patient to return to work.

These referees should be appointed by the state central body, not by the locals (as is now done in accident cases).

Provision must be made for payment of these referees,—per case.

The reports of these referees must stand as evidence at hearings.

(If referees are compelled to go to hearings we shall not get the right sort of men to serve as referees at any rate we can afford. This difficulty has already shown itself in cases coming before the Accident Board.)

The question comes up to dentists and dental surgeons—very necessary citizens. They must be taken account of.

Provision must be made to ensure that the referee shall not be the same man as the consultant of the practitioner in charge of the case.

Page 352 of the reprint, lines 8 sqq.

We feel that the recommendations here given, sound enough as to big metropolitan hospitals, cannot be made to apply to many hospitals in small or even larger communities, hospitals in which there is no service head, hospitals still run under the old rotating service plan.

Many of these give excellent service, and must be considered.

It is obvious that some provision must be made for employment and compensation of the masseur, the hydrotherapist, etc.,—people we think too little of, considering how indispensable they are.

Pharmacists who turn in bills should in turn be subject to reasonable control.

It is evident that there must be medical inspectors,—local officers,—young medics presumably, who shall have general charge of the local situation, shall refer cases to the central bodies, if they think patients should go to base hospitals, should try light work, should be discharged;—shall report all irregularities. Only with such "scouts" can this scheme be protected from its natural enemies.

Given the right kind of men, their salaries need not be large,—and they would save money.

Change of physicians at the request of either patient or doctor, must be allowed, subject to the *visé* of the medical inspector.

The question comes up of limitation of work to be done by any one doctor. Obviously, there is a limit beyond which really adequate care is not possible.

We feel, however, that such control should be vested in the central committee.

It is apparently impossible to formulate exact rules as to this.

In a properly equipped company hospital,—as for example the American Steel Wire of Worcester, or even the smaller Gray and Davis plant in Cambridge, one man can do far more work—and do it well—than is possible to the best ordinary general practitioner with his more meagre equipment. One point, not unimportant, is that the necessary expenses of the central medical committee, the charges for hearings, etc., the expenses for and by medical referees, should *not* be charged as medical expenses.

They are really part of the administrative overhead, and have nothing to do with medical care of the sick or hurt.

If we bear this in mind, we shall avoid a source

of confusion that has given trouble under our Accident Law.

We feel that there should be a committee of panel physicians in a given locale, to hear disputes, to *recommend* action to the central committee, but without power to decide.

Such a committee would recommend action to the central commission, to the local board of directors, etc.

We feel that a permanent appointed complaint-committee is preferable for various reasons to a "pick-up" committee.

#### APPOINTMENTS.

DR. CHEVALIER JACKSON of Pittsburgh, Pa., has been appointed professor of bronchoscopy, esophagoscopy and direct laryngoscopy at the New York Post Graduate Medical School and Hospital.

DR. CHARLES W. PILGRIM, superintendent of the Hudson River Hospital, Poughkeepsie, N. Y., has been appointed president of the New York State Lunacy Board.

#### RECENT DEATHS.

DR. FRANKLIN HAVEN CLARK, who died recently at Denver, Colo., was born in Boston on March 17, 1862, the son of a physician. He received the degree of A.B. from Harvard in 1884, and that of M.D. in 1887. Owing to the failure of his health, he never engaged in practice, but after studying for a time in Germany, devoted the remainder of his life to travel, especially in Japan, Italy, and in the Orient. He is survived by his widow, one daughter, and three sons.

DR. JOHN M. EAGER, who died recently at Naples, Italy, was born in New York State in 1854. He received the degree of M.D. from the New York College of Physicians and Surgeons in 1887, and for the next five years practised his profession in Philadelphia. On July 1, 1892, he was appointed assistant surgeon in the United States Public Health Service. He was commissioned surgeon on February 9, 1900, and on August 4, 1912, was assigned to the sanitary office of the American Consulate in Naples.

DR. RUDOLPH VON ESDORF, a surgeon of the United States Public Health Service, who died recently at Lincolnton, N.C., was born in Pennsylvania in 1873. He was well known for his investigations on malaria, typhoid and yellow fever. He had served at various quarantine stations in Savannah, Havana, and elsewhere, and at the time of his death was in charge of the United States Marine Hospital at New Orleans. He is survived by his widow and by one daughter.

#### NOTICES.

SUFFOLK DISTRICT MEDICAL SOCIETY, CENSORS' EXAMINATION.—The censors of the Suffolk District Medical Society will meet to examine candidates for admission to the Massachusetts Medical Society at the Boston Medical Library, 8 The Fenway, on Thursday, November 9, at 4 P.M.

Candidates, who must be residents of the Suffolk District or non-residents of Massachusetts, should make a personal application, at least three days before the examination, to the Secretary, at 355 Marlborough street, between 4 and 5 o'clock, P.M. (except Saturdays and Sundays), and present their medical diplomas.

DAVID CHEEVER, Secretary,  
Suffolk District Medical Society.